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UNITED STATES DISTRICT COURT

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NORTHERN DISTRICT OF CALIFORNIA

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ANIBAL RODRIGUEZ, et al. individually and on behalf of all others similarly situated,

Case No. 3:20-CV-04688-RS

16

Plaintiff,

**APPENDIX A IN SUPPORT OF GOOGLE LLC'S MOTION FOR SUMMARY JUDGMENT – EVIDENTIARY SUPPORT**

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vs.

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GOOGLE LLC,

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Defendant.

Date:        July 25, 2024
Time:        1:30 p.m.
Courtroom:   3, 17th Floor
Judge:       Hon. Richard Seeborg

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Action Filed:  July 14, 2020
Trial Date:    February 10, 2025

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### APPENDIX A – EVIDENTIARY SUPPORT

2        Appendix A contains the evidentiary support that Google's Motion For Summary Judgment

3   relies upon. Other than Tabs A-2, A-16, and A-23, the documents contained in Appendix A have

4   previously been filed in this litigation.[1]

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| CITATION | ECF | PDF PAGES | DOCUMENT DESCRIPTION |
|---|---|---|---|
| Appx. A-1 | ECF 65 | 4 - 34 | Sample of Historic Google Analytics for Firebase Terms of Service and Google Analytics for Firebase Use Policy |
| Appx. A-2 | N/A | 35 - 103 | Additional Selection of Historic Google Analytics for Firebase Terms of Service (2016 to present) |
| Appx. A-3 | ECF 315-5 | 104 - 106 | Declaration of Sal Cataldo in Support of Class Certification |
| Appx. A-4 | ECF 315-6 | 107 - 109 | Declaration of Susan Harvey in Support of Class Certification |
| Appx. A-5 | ECF 315-7 | 110 - 112 | Declaration of Anibal Rodriguez in Support of Class Certification |
| Appx. A-6 | ECF 315-8 | 113 – 115 | Declaration of Julian Santiago in Support of Class Certification |
| Appx. A-7 | ECF 323-1 | 116 - 181 | Selection of Historic Privacy Policies (2016 to Present) |
| Appx. A-8 | ECF 324-1 | 182 – 186 | "Google Analytics," screenshotted on August 24, 2023 from https://firebase.google.com/docs/analytics |
| Appx. A-9 | ECF 324-4 | 187 – 194 | "[GA4] Automatically collected events," screenshotted on August 24, 2023 from https://support.google.com/firebase/answer/9234069?hl=en |
| Appx. A-10[2] | ECF 361-13 | 195 – 197 | Excerpt of "GEO Privacy Champion," GOOG-RDGZ-00161364 |
| Appx. A-11 | ECF 361-58 | 198 - 223 | Excerpts of the Expert Report of Jonathan Hochman |

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[1] Google has separately provided the court with an Appendix B, which includes unredacted versions of certain documents from Appendix A. The court has already ruled on whether the unredacted material should be sealed. The versions of these documents that were filed publicly—after the Court's respective Orders on sealing—are all found in Appendix A.

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[2] Unredacted at Appx. B-2.

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| CITATION | ECF | PDF PAGES | DOCUMENT DESCRIPTION |
|---|---|---|---|
| Appx. A-12[3] | ECF 361-59 | 224 – 238 | Expert Report of Jonathan E. Hochman, Appendix E (Ad Campaigns and Conversion Tracking/Modeling) |
| Appx. A-13[4] | ECF 364-1 | 239 – 267 | Google's Responses to Plaintiff's Interrogatory No. One |
| Appx. A-14[5] | ECF 364-2 | 268 – 286 | "App Attribution in GAA," GOOG-RDGZ-00056514 |
| Appx. A-15 | ECF 364-3 | 287 – 291 | Excerpts from the Deposition Transcript of Steve Ganem |
| Appx. A-16 | N/A | 292 – 295 | App'x X-4 to Rebuttal Expert Report of John Black, Ph.D. - Selection of Historic Google Policies Prohibiting "Fingerprinting" |
| Appx. A-17 | ECF 364-6 | 296 – 300 | Excerpts from the Deposition Transcript of Sal Cataldo |
| Appx. A-18 | ECF 364-7 | 301 – 304 | Excerpts from the Deposition Transcript of Belinda Langner |
| Appx. A-19 | ECF 364-17 | 305 – 311 | Excerpts from the Deposition Transcript of Michael J. Lasinski |
| Appx. A-20 | ECF 364-19 | 312 – 324 | Excerpts from the Deposition Transcript of Jonathan Hochman |
| Appx. A-21 | ECF 364-20 | 325 – 327 | Excerpt of the Rebuttal Expert Report of John R. Black, Ph.D |
| Appx. A-22 | ECF 364-22 | 328 – 333 | Google's Responses to Interrogatories Nos. 15 & 16 |
| Appx. A-23 | N/A | 334 - 339 | "Log Events," screenshotted on March 27, 2024 from https://firebase.google.com/docs/analytics/events?platform=android |

[3] Unredacted at Appx. B-1.
[4] Unredacted at Appx. B-3.
[5] Unredacted at Appx. B-4.

# Appendix A-1

1   **WILLKIE FARR & GALLAGHER LLP**
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9   Attorneys for
GOOGLE LLC
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11                  **UNITED STATES DISTRICT COURT**

12                  **NORTHERN DISTRICT OF CALIFORNIA**

13                           **SAN FRANCISCO**

14   ANIBAL RODRIQUEZ AND JULIE ANNA
MUNIZ, individually and on behalf of all other      Case No.  3:20-CV-04688
15   similarly situated,

16                        Plaintiff,              **DECLARATION OF ANDREW ROPE
                                                 IN SUPPORT OF DEFENDANT
17        vs.                                    GOOGLE LLC'S MOTION TO
                                                 DISMISS FIRST AMENDED
18   GOOLGLE LLC,                                COMPLAINT

19                        Defendant.
                                                 Date:    February 25, 2021
20                                               Time:    1:30 p.m.
                                                 Court:   Courtroom 3 – 17th Floor
21
                                                 Hon. Richard Seeborg
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ANDREW ROPE DECL. ISO MOTION TO DISMISS FIRST AMENDED COMPLAINT
Case No.  3:20-CV-04688

I, Andrew Rope, declare as follows:

1.      I am a senior project manager on the legal team at Google LLC, defendant in the above-captioned matter. I have personal knowledge of the facts set forth below and, if called as a witness in a court of law, could and would testify competently thereto.

2.      Attached hereto as **Exhibit 1(a)-(b)** are true and correct copies of the Google Analytics for Firebase Terms of Service agreements in effect in 2019 and 2020, which were downloaded on October 8, 2020 at:

https://firebase.google.com/terms/analytics#previous_versions
https://firebase.google.com/terms/analytics/20181001.

3.      Attached hereto as **Exhibit 2(a)-(b)** are true and correct copies of the Google Analytics for Firebase Use Policies in effect in 2019 and 2020, which were downloaded on October 8, 2020 at:

https://firebase.google.com/policies/analytics
https://firebase.google.com/policies/analytics/2017-05-17.

I declare under penalty of perjury that the foregoing is true and correct. Executed on October 13, 2020 at Aptos, California.

By: _Andrew Rope_ _____
Andrew Rope

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Case No.  3:20-CV-04688

# EXHIBIT 01-A

(https://google.com/racialequity)

# GOOGLE ANALYTICS FOR FIREBASE TERMS OF SERVICE

**Terms last modified: April 17, 2019** | Previous versions (#previous_versions)

These Google Analytics for Firebase Terms of Service are entered into by the entity or individual using the Service (**"You"**) and:

(A) if Your address is in any country within Europe, the Middle East, or Africa: Google Ireland Limited (**"Google"**), with offices at Gordon House, Barrow Street, Dublin 4, Ireland;

(B) if Your address is in a country within the Asia Pacific region: Google Asia Pacific Pte. Ltd. (**"GAP"**), of 70 Pasir Panjang Road, #03-71, Mapletree Business City II, Singapore 117371, unless Your address is in one of the following countries, in which case the specified entity as a reseller:

- Australia: Google Australia Pty Ltd of Level 5, 48 Pirrama Road, Pyrmont 2009, NSW, Australia

- New Zealand: Google New Zealand Limited of PWC Tower, Level 27, 188 Quay Street, Auckland, New Zealand 1010

- Japan: Google Japan G.K. of Roppongi Hills Mori Tower, 6-10-1, Roppongi, Minato-ku, Tokyo, Japan

(**"Google Reseller"**) and references to "**Google**" mean Google LLC, GAP, Google Reseller, and/or their affiliates, depending on the context; or

(C) if Your address is anywhere else in the world: Google LLC (**"Google"**), with offices at 1600 Amphitheatre Parkway, Mountain View, California 94043.

This Agreement (as defined below) governs Your use of Google Analytics for Firebase (the **"Service"**). BY CLICKING THE "I ACCEPT" BUTTON, COMPLETING THE REGISTRATION PROCESS, OR USING THE SERVICE, YOU ACKNOWLEDGE THAT YOU HAVE REVIEWED AND ACCEPT THIS AGREEMENT AND ARE AUTHORIZED TO ACT ON BEHALF OF, AND BIND TO THIS AGREEMENT, THE OWNER OF THIS ACCOUNT. You confirm that you will comply with the

<u>Google Analytics for Firebase Policies</u> (https://firebase.google.com/policies/analytics) and that you have separately entered the <u>Google API Terms of Service</u> (https://developers.google.com/terms/) with Google LLC (which, along with the Google Analytics for Firebase Terms of Service and the <u>Google Analytics for Firebase Policies</u> (https://firebase.google.com/policies/analytics/), mean the "**Agreement**"). The parties agree as follows:

## 1. Definitions.

"**Account**" refers to the account for the Service.

"**Affiliate(s)**" means in relation to each of the parties: (a) any parent company of that party; and (b) any corporate body of which that party directly or indirectly has control or which is directly or indirectly controlled by the same person or group of persons as that party.

"**Confidential Information**" includes any proprietary data and any other information disclosed by one party to the other in writing and marked "confidential" or disclosed orally and, within five business days, reduced to writing and marked "confidential". However, Confidential Information will not include any information that is or becomes known to the general public, which is already in the receiving party's possession prior to disclosure by a party or which is independently developed by the receiving party without the use of Confidential Information.

"**Customer Data**" means the data You collect, process or store using the Service concerning the characteristics and activities of Users.

"**Documentation**" means any accompanying documentation made available to You by Google for use with the Processing Software, including any documentation available online.

"**SDK**" means the Firebase Software Development Kit, which is used or incorporated in an App for the purpose of collecting Customer Data, together with any fixes, updates and upgrades provided to You.

"**Processing Software**" means the Google server-side software and any upgrades, which analyzes the Customer Data and generates the Reports.

"**App**" means any app or other resource that sends data to the Service. Each App must be under Your control.

"**Privacy Policy**" means the privacy policy on an App.

"**Report**" means the resulting analysis made available to You.

**"Servers"** means the servers controlled by Google or its Affiliates on which the Processing Software and Customer Data are stored.

**"Software"** means the SDK and the Processing Software.

**"Third Party"** means any third party (i) to which You provide access to Your Account or (i) for which You use the Service to collect information on the third party's behalf.

**"Users"** means users of Your Apps.

The words **"include"** and **"including"** mean "including but not limited to."

## 2. Fees and Service.

Google and its Affiliates may change its fees and payment policies for the Service from time to time. The changes to the fees or payment policies are effective upon Your acceptance of those changes which will be posted at firebase.google.com/terms/analytics. Unless otherwise stated, all fees are quoted in U.S. Dollars. Any outstanding balance becomes immediately due and payable upon termination of this Agreement and any collection expenses (including attorneys' fees) incurred by Google and its Affiliates will be included in the amount owed, and may be charged to the credit card or other billing mechanism associated with Your AdWords account.

## 3. Member Account, Password, and Security.

To register for the Service, You must be acting in the course of business, complete the registration process by providing Google with current, complete and accurate information as prompted by the registration form, including Your e-mail address (username) and password. You will protect Your passwords and take full responsibility for Your own, and third party, use of Your accounts. You are solely responsible for any and all activities that occur under Your Account. You will notify Google immediately upon learning of any unauthorized use of Your Account or any other breach of security. Google or its Affiliates' support staff may, from time to time, log in to the Service under Your Account in order to maintain or improve service, including to provide You assistance with technical or billing issues. By creating Your Account you agree to receive electronic statements from Google and its Affiliates.

## 4. Nonexclusive License.

Subject to the terms and conditions of this Agreement, (a) Google grants You a limited, revocable, non-exclusive, non-sublicensable license to install, copy and use the SDK solely as necessary for You to use the Service on Your Apps or Third Parties Apps; and (b) You may remotely access, view and download Your Reports. You will not (and You will not allow any third party to) use data labeled as belonging to a third party in the Service for purposes other than generating, viewing, and downloading Reports. You will comply with all applicable laws and regulations and Your agreements with third parties in Your use of and access to the Documentation, Software, Service and Reports.

## 5. Confidentiality.

Neither party will use or disclose the other party's Confidential Information without the other's prior written consent except for the purpose of performing its obligations under this Agreement or if required by law, regulation or court order; in which case, the party being compelled to disclose Confidential Information will give the other party as much notice as is reasonably practicable prior to disclosing the Confidential Information if permitted by law.

## 6. Information Rights and Publicity.

Google and its Affiliates may retain and use, subject to the terms of its privacy policy (located at www.google.com/privacy.html), information collected in Your use of the Service. Google will not share Your Customer Data or any Third Party's Customer Data with any third parties unless Google (i) has Your consent for any Customer Data or any Third Party's consent for the Third Party's Customer Data; (ii) concludes that it is required by law or has a good faith belief that access, preservation or disclosure of Customer Data is reasonably necessary to protect the rights, property or safety of Google, its users or the public; or (iii) provides Customer Data in certain limited circumstances to third parties to carry out tasks on Google's behalf (e.g., billing or data storage) with strict restrictions that prevent the data from being used or shared except as directed by Google. When this is done, it is subject to agreements that oblige those parties to process Customer Data only on Google's instructions and in compliance with this Agreement and appropriate confidentiality and security measures.

## 7. Privacy.

You will not, and will not assist or permit any third party to, pass information to Google that Google could use or recognize as personally identifiable information. You will have and abide by an appropriate Privacy Policy and will comply with all applicable laws, policies, and

regulations relating to the collection, usage and sharing of information from Users. <mark>You must post a Privacy Policy and that Privacy Policy must provide notice of Your use of cookies, identifiers for mobile devices (e.g., Android Advertising Identifier or Advertising Identifier for iOS) or similar technology that are used to collect data. You must disclose the use of the Service, and how it collects and processes data.</mark> This can be done by displaying a prominent link to the site "How Google uses data when you use our partners' sites or apps", (located at www.google.com/policies/privacy/partners/, or any other URL Google may provide from time to time). <mark>You will use commercially reasonable efforts to ensure that a User is provided with clear and comprehensive information about, and consents to, the storing and accessing of cookies or other information on the User's device where such activity occurs in connection with the Service and where providing such information and obtaining such consent is required by law.</mark>

You must not circumvent any privacy features that are part of the Service.

Your access to and use of any other DoubleClick or Google service is subject to the applicable terms between You and Google regarding that service.

## 8. Indemnification.

To the maximum extent permitted by applicable law, You will indemnify, hold harmless and defend Google and its Affiliates, at Your expense, from any and all third-party claims, actions, proceedings, and suits brought against Google or any of its officers, directors, employees, agents or Affiliates, and all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, reasonable attorneys' fees and other litigation expenses) incurred by Google or any of its officers, directors, employees, agents or Affiliates, arising out of or relating to (i) Your breach of any term or condition of this Agreement, (ii) Your use of the Service, (iii) Your violations of applicable laws, rules or regulations in connection with the Service, (iv) any representations and warranties made by You concerning any aspect of the Service, the Software or Reports to any Third Party; (v) any claims made by or on behalf of any Third Party pertaining directly or indirectly to Your use of the Service, the Software or Reports; (vi) violations of Your obligations of privacy to any Third Party; and (vii) any claims with respect to acts or omissions of any Third Party in connection with the Service, the Software or Reports. Google will provide You with written notice of any claim, suit or action from which You must indemnify Google and its Affiliates. You will cooperate as fully as reasonably required in the defense of any claim. Google and its Affiliates reserve the right, at their own expense, to assume the exclusive defense and control of any matter subject to indemnification by You.

## 9. Third Parties.

If You use the Service on behalf of a Third Party or a Third Party otherwise uses the Service through Your Account, whether or not You are authorized by Google to do so, then You represent and warrant that (a) You are authorized to act on behalf of, and bind to this Agreement, the Third Party to all obligations that You have under this Agreement, (b) Google and its Affiliates may share with the Third Party any Customer Data that is specific to the Third Party's Apps, and (c) You will not disclose Third Party's Customer Data to any other party without the Third Party's consent.

## 10. DISCLAIMER OF WARRANTIES.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT AS EXPRESSLY PROVIDED FOR IN THIS AGREEMENT, GOOGLE MAKES NO OTHER WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR USE AND NON-INFRINGEMENT. THE SERVICE IS PROVIDED "AS IS".

## 11. LIMITATION OF LIABILITY.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, GOOGLE WILL NOT BE LIABLE FOR YOUR LOST PROFITS (WHETHER DIRECT OR INDIRECT) OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE LOSSES OR DAMAGES (WHETHER OR NOT FORESEEABLE OR CONTEMPLATED BY THE PARTIES), EVEN IF GOOGLE OR ITS AFFILIATES HAVE BEEN ADVISED OF, KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY. GOOGLE AND ITS AFFILIATES' TOTAL CUMULATIVE LIABILITY TO YOU OR ANY OTHER PARTY FOR ANY LOSS OR DAMAGES RESULTING FROM CLAIMS, DEMANDS, OR ACTIONS ARISING OUT OF OR RELATING TO THIS AGREEMENT WILL NOT EXCEED $500 (USD).

## 12. Proprietary Rights Notice.

The Service, which includes the Software and all intellectual property rights therein are, and will remain, the property of Google and its Affiliates. All rights in and to the Software not expressly granted to You in this Agreement are reserved and retained by Google, its Affiliates, and its licensors without restriction, including, Google's (and its Affiliates') right to sole ownership of the Software and Documentation. Without limiting the generality of the foregoing, You agree, to

the maximum extent permitted by applicable law, not to (and not to allow any third party to): (a) sublicense, distribute, or use the Service or Software outside of the scope of the license granted in this Agreement; (b) copy, modify, adapt, translate, prepare derivative works from, reverse engineer, disassemble, or decompile the Software or Documentation or otherwise attempt to discover any source code or trade secrets related to the Service; (c) rent, lease, sell, assign or otherwise transfer rights in or to the Software, the Documentation or the Service; (d) use, post, transmit or introduce any device, software or routine which interferes or attempts to interfere with the operation of the Service or the Software; (e) use the trademarks, trade names, service marks, logos, domain names and other distinctive brand features or any copyright or other proprietary rights associated with the Service for any purpose without the express written consent of Google and its Affiliates ; (f) register, attempt to register, or assist anyone else to register any trademark, trade name, serve marks, logos, domain names and other distinctive brand features, copyright or other proprietary rights associated with Google or its Affiliates other than in the name of Google (or its Affiliates as the case may be); (g) remove, obscure, or alter any notice of copyright, trademark, or other proprietary right appearing in or on any item included with the Service or Software or (h) seek, in a proceeding filed during the term of this Agreement or for one year after such term, an injunction of any portion of the Service based on patent infringement.

## 13. U.S. Government Rights.

If the use of the Service is being acquired by or on behalf of the U.S. Government or by a U.S. Government prime contractor or subcontractor (at any tier), in accordance with 48 C.F.R. 227.7202-4 (for Department of Defense (DOD) acquisitions) and 48 C.F.R. 2.101 and 12.212 (for non-DOD acquisitions), the Government's rights in the Software, including its rights to use, modify, reproduce, release, perform, display or disclose the Software or Documentation, will be subject in all respects to the commercial license rights and restrictions provided in this Agreement.

## 14. Term and Termination.

Either party may terminate this Agreement at any time with notice. Upon any termination of this Agreement, Google will stop providing, and You will stop using the Service. In the event of any termination (a) You will not be entitled to any refunds of any usage fees or any other fees, and (b) any outstanding balance for Service rendered through the date of termination will be immediately due and payable in full and (c) all of Your historical Report data will no longer be available to You.

## 15. Modifications to Terms of Service and Other Policies.

Google may modify these terms or any additional terms that apply to the Service to, for example, reflect changes to the law or changes to the Service. You should look at the terms regularly. Google will post notice of modifications to these terms at firebase.google.com/terms/analytics (//firebase.google.com/terms/analytics),the Google Analytics for Firebase Policies at firebase.google.com/policies/analytics (//firebase.google.com/policies/analytics), or other policies referenced in these terms at the applicable URL for such policies. Changes will not apply retroactively and will become effective no sooner than 14 days after they are posted. If You do not agree to the modified terms for the Service, You should discontinue Your use of the Service. No amendment to or modification of this Agreement will be binding unless (i) in writing and signed by a duly authorized representative of Google, (ii) You accept updated terms online, or (iii) You continue to use the Service after Google has posted updates to the Agreement or to any policy governing the Service.

## 16. Applicable Law and Venue.

(a) Except as set forth in Sections 16(b) and (c) below, all claims arising out of or relating to this Agreement or the Services ("Disputes") will be governed by California law, excluding California's conflict of laws rules, and all Disputes will be litigated exclusively in the federal or state courts of Santa Clara County, California, USA, and You and Google consent to personal jurisdiction in those courts.

(b) If Your principal place of business (for entities) or place of residence (for individuals) is in any country within APAC (other than Australia, Japan, New Zealand or Singapore) or Latin America, this Section 16(b) will apply instead of Section 16(a) above. ALL DISPUTES (AS DEFINED ABOVE) WILL BE GOVERNED BY CALIFORNIA LAW, EXCLUDING CALIFORNIA'S CONFLICT OF LAWS RULES. The parties will try in good faith to settle any Dispute within 30 days after the Dispute arises. If the Dispute is not resolved within 30 days, it must be resolved by arbitration by the American Arbitration Association's International Centre for Dispute Resolution in accordance with its Expedited Commercial Rules in force as of the date of this Agreement ("Rules"). The parties will mutually select one arbitrator. The arbitration will be conducted in English in Santa Clara County, California, USA. Either party may apply to any competent court for injunctive relief necessary to protect its rights pending resolution of the arbitration. The arbitrator may order equitable or injunctive relief consistent with the remedies and limitations in this Agreement. Subject to the confidentiality requirements in Section 5, either party may petition any competent court to issue any order necessary to protect that

party's rights or property; this petition will not be considered a violation or waiver of this governing law and arbitration section and will not affect the arbitrator's powers, including the power to review the judicial decision. The parties stipulate that the courts of Santa Clara County, California, USA, are competent to grant any order under this subsection. The arbitral award will be final and binding on the parties and its execution may be presented in any competent court, including any court with jurisdiction over either party or any of its property. Any arbitration proceeding conducted in accordance with this section will be considered Confidential Information under this Agreement's confidentiality section, including (i) the existence of, (ii) any information disclosed during, and (iii) any oral communications or documents related to the arbitration proceedings. The parties may also disclose the information described in this section to a competent court as may be necessary to file any order under this section or execute any arbitral decision, but the parties must request that those judicial proceedings be conducted in camera (in private). The parties will pay the arbitrator's fees, the arbitrator's appointed experts' fees and expenses, and the arbitration center's administrative expenses in accordance with the Rules. In its final decision, the arbitrator will determine the non-prevailing party's obligation to reimburse the amount paid in advance by the prevailing party for these fees. Each party will bear its own lawyers' and experts' fees and expenses, regardless of the arbitrator's final decision.

(c) If Your principal place of business (for entities) or place of residence (for individuals) is in Greece, all Disputes (as defined above) will be governed by Greek law and the parties submit to the exclusive jurisdiction of the courts of Athens in relation to any Dispute.

## 17. Miscellaneous

Google and its Affiliates will be excused from performance in this Agreement to the extent that performance is prevented, delayed or obstructed by causes beyond its reasonable control. This Agreement (including any amendment agreed upon by the parties in writing) represents the complete agreement between You and Google concerning its subject matter, and supersedes all prior agreements and representations between the parties. If any provision of this Agreement is held to be unenforceable for any reason, such provision will be reformed to the extent necessary to make it enforceable to the maximum extent permissible so as to effect the intent of the parties, and the remainder of this Agreement will continue in full force and effect. Certain laws of the jurisdiction in which you reside may confer rights and remedies and imply terms into this Agreement that cannot be excluded. Those rights, remedies, and implied terms are not excluded by this Agreement. To the extent that the relevant laws permit Google to limit their operation, Google's liability under those laws will be limited at its option, to the supply of the services again, or payment of the cost of having the services supplied again. The United

Nations Convention on Contracts for the International Sale of Goods and the Uniform Computer Information Transactions Act do not apply to this Agreement. The Software is controlled by U.S. Export Regulations, and it may be not be exported to or used by embargoed countries or individuals. Any notices to Google must be sent to: Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA, with a copy to Legal Department, via first class or air mail or overnight courier, and are deemed given upon receipt. A waiver of any default is not a waiver of any subsequent default. You may not assign or otherwise transfer any of Your rights in this Agreement without Google's prior written consent, and any such attempt is void. Google may assign or otherwise transfer this Agreement to any of its Affiliates. The relationship between Google and You is not one of a legal partnership relationship, but is one of independent contractors. This Agreement will be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. The following sections of this Agreement will survive any termination thereof: 1, 4, 5, 6 , 7, 8, 9, 10, 11, 12, 14, 16 and 17.

## Previous versions

- Oct 1, 2018 (/terms/analytics/20181001)

- May 17, 2017 (/terms/analytics/20170517)

- May 18, 2016 (/terms/analytics/20160518)

# EXHIBIT 01-B

(https://google.com/racialequity)

# GOOGLE ANALYTICS FOR FIREBASE TERMS OF SERVICE

This is an archive. For the current version of this page, head to Google Analytics for Firebase Terms of Service

s/analytics).

**Terms last modified: Oct 1, 2018**

These Google Analytics for Firebase Terms of Service, the Google Analytics for Firebase Policies (/policies/analytics) and the Google API Terms of Service (//developers.google.com/terms/) (this **"Agreement"**) are entered into by Google and the entity or individual using the Service (**"You"**). This Agreement governs Your use of Google Analytics for Firebase (the **"Service"**). BY CLICKING THE "I ACCEPT" BUTTON, COMPLETING THE REGISTRATION PROCESS, OR USING THE SERVICE, YOU ACKNOWLEDGE THAT YOU HAVE REVIEWED AND ACCEPT THIS AGREEMENT AND ARE AUTHORIZED TO ACT ON BEHALF OF, AND BIND TO THIS AGREEMENT, THE OWNER OF THIS ACCOUNT. In consideration of the foregoing, the parties agree as follows:

## 1. Definitions.

**"Account"** refers to the account for the Service.

**"Affiliate(s)"** means in relation to each of the parties: (a) any parent company of that party; and (b) any corporate body of which that party directly or indirectly has control or which is directly or indirectly controlled by the same person or group of persons as that party.

**"Confidential Information"** includes any proprietary data and any other information disclosed by one party to the other in writing and marked "confidential" or disclosed orally and, within five business days, reduced to writing and marked "confidential". However, Confidential Information will not include any information that is or becomes known to the general public, which is already in the receiving party's possession prior to disclosure by a party or which is independently developed by the receiving party without the use of Confidential Information.

"**Customer Data**" means the data You collect, process or store using the Service concerning the characteristics and activities of Users.

"**Documentation**" means any accompanying documentation made available to You by Google for use with the Processing Software, including any documentation available online.

"**Google**" means (i) Google Ireland Limited, with offices at Gordon House, Barrow Street, Dublin 4, Ireland, if Your principal place of business (for entities) or place of residence (for individuals) is in any country within Europe, the Middle East, or Africa ("EMEA"), (ii) Google Asia Pacific Pte. Ltd., with offices at 70 Pasir Panjang Road, #03-01, Mapletree Business City II, Singapore 117371 (or its affiliate reseller(s)), if Your principal place of business (for entities) or place of residence (for individuals) is in any country within the Asia Pacific region ("APAC"), or (iii) Google LLC, with offices at 1600 Amphitheatre Parkway, Mountain View, California 94043, if Your principal place of business (for entities) or place of residence (for individuals) is in any country in the world other than those in EMEA and APAC.

"**SDK**" means the Firebase Software Development Kit, which is used or incorporated in an App for the purpose of collecting Customer Data, together with any fixes, updates and upgrades provided to You.

"**Processing Software**" means the Google server-side software and any upgrades, which analyzes the Customer Data and generates the Reports.

"**App**" means any app or other resource that sends data to the Service. Each App must be under Your control.

"**Privacy Policy**" means the privacy policy on an App.

"**Report**" means the resulting analysis made available to You.

"**Servers**" means the servers controlled by Google or its Affiliates on which the Processing Software and Customer Data are stored.

"**Software**" means the SDK and the Processing Software.

"**Third Party**" means any third party (i) to which You provide access to Your Account or (i) for which You use the Service to collect information on the third party's behalf.

"**Users**" means users of Your Apps.

The words "**include**" and "**including**" mean "including but not limited to."

## 2. Fees and Service.

Google and its Affiliates may change its fees and payment policies for the Service from time to time. The changes to the fees or payment policies are effective upon Your acceptance of those changes which will be posted at firebase.google.com/terms/analytics. Unless otherwise stated, all fees are quoted in U.S. Dollars. Any outstanding balance becomes immediately due and payable upon termination of this Agreement and any collection expenses (including attorneys' fees) incurred by Google and its Affiliates will be included in the amount owed, and may be charged to the credit card or other billing mechanism associated with Your AdWords account.

## 3. Member Account, Password, and Security.

To register for the Service, You must be acting in the course of business, complete the registration process by providing Google with current, complete and accurate information as prompted by the registration form, including Your e-mail address (username) and password. You will protect Your passwords and take full responsibility for Your own, and third party, use of Your accounts. You are solely responsible for any and all activities that occur under Your Account. You will notify Google immediately upon learning of any unauthorized use of Your Account or any other breach of security. Google or its Affiliates' support staff may, from time to time, log in to the Service under Your Account in order to maintain or improve service, including to provide You assistance with technical or billing issues. By creating Your Account you agree to receive electronic statements from Google and its Affiliates.

## 4. Nonexclusive License.

Subject to the terms and conditions of this Agreement, (a) Google grants You a limited, revocable, non-exclusive, non-sublicensable license to install, copy and use the SDK solely as necessary for You to use the Service on Your Apps or Third Parties Apps; and (b) You may remotely access, view and download Your Reports. You will not (and You will not allow any third party to) use data labeled as belonging to a third party in the Service for purposes other than generating, viewing, and downloading Reports. You will comply with all applicable laws and regulations and Your agreements with third parties in Your use of and access to the Documentation, Software, Service and Reports.

## 5. Confidentiality.

Neither party will use or disclose the other party's Confidential Information without the other's prior written consent except for the purpose of performing its obligations under this Agreement or if required by law, regulation or court order; in which case, the party being compelled to disclose Confidential Information will give the other party as much notice as is reasonably practicable prior to disclosing the Confidential Information if permitted by law.

## 6. Information Rights and Publicity.

Google and its Affiliates may retain and use, subject to the terms of its privacy policy (located at www.google.com/privacy.html), information collected in Your use of the Service. Google will not share Your Customer Data or any Third Party's Customer Data with any third parties unless Google (i) has Your consent for any Customer Data or any Third Party's consent for the Third Party's Customer Data; (ii) concludes that it is required by law or has a good faith belief that access, preservation or disclosure of Customer Data is reasonably necessary to protect the rights, property or safety of Google, its users or the public; or (iii) provides Customer Data in certain limited circumstances to third parties to carry out tasks on Google's behalf (e.g., billing or data storage) with strict restrictions that prevent the data from being used or shared except as directed by Google. When this is done, it is subject to agreements that oblige those parties to process Customer Data only on Google's instructions and in compliance with this Agreement and appropriate confidentiality and security measures.

## 7. Privacy.

You will not, and will not assist or permit any third party to, pass information to Google that Google could use or recognize as personally identifiable information. You will have and abide by an appropriate Privacy Policy and will comply with all applicable laws, policies, and regulations relating to the collection, usage and sharing of information from Users. You must post a Privacy Policy and that Privacy Policy must provide notice of Your use of cookies, identifiers for mobile devices (e.g., Android Advertising Identifier or Advertising Identifier for iOS) or similar technology that are used to collect data. You must disclose the use of the Service, and how it collects and processes data. This can be done by displaying a prominent link to the site "How Google uses data when you use our partners' sites or apps", (located at www.google.com/policies/privacy/partners/, or any other URL Google may provide from time to time). You will use commercially reasonable efforts to ensure that a User is provided with clear and comprehensive information about, and consents to, the storing and accessing of cookies or other information on the User's device where such activity occurs in connection

==with the Service and where providing such information and obtaining such consent is required by law.==

You must not circumvent any privacy features that are part of the Service.

Your access to and use of any other DoubleClick or Google service is subject to the applicable terms between You and Google regarding that service.

## 8. Indemnification.

To the maximum extent permitted by applicable law, You will indemnify, hold harmless and defend Google and its Affiliates, at Your expense, from any and all third-party claims, actions, proceedings, and suits brought against Google or any of its officers, directors, employees, agents or Affiliates, and all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, reasonable attorneys' fees and other litigation expenses) incurred by Google or any of its officers, directors, employees, agents or Affiliates, arising out of or relating to (i) Your breach of any term or condition of this Agreement, (ii) Your use of the Service, (iii) Your violations of applicable laws, rules or regulations in connection with the Service, (iv) any representations and warranties made by You concerning any aspect of the Service, the Software or Reports to any Third Party; (v) any claims made by or on behalf of any Third Party pertaining directly or indirectly to Your use of the Service, the Software or Reports; (vi) violations of Your obligations of privacy to any Third Party; and (vii) any claims with respect to acts or omissions of any Third Party in connection with the Service, the Software or Reports. Google will provide You with written notice of any claim, suit or action from which You must indemnify Google and its Affiliates. You will cooperate as fully as reasonably required in the defense of any claim. Google and its Affiliates reserve the right, at their own expense, to assume the exclusive defense and control of any matter subject to indemnification by You.

## 9. Third Parties.

If You use the Service on behalf of a Third Party or a Third Party otherwise uses the Service through Your Account, whether or not You are authorized by Google to do so, then You represent and warrant that (a) You are authorized to act on behalf of, and bind to this Agreement, the Third Party to all obligations that You have under this Agreement, (b) Google and its Affiliates may share with the Third Party any Customer Data that is specific to the Third Party's Apps, and (c) You will not disclose Third Party's Customer Data to any other party without the Third Party's consent.

## 10. DISCLAIMER OF WARRANTIES.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT AS EXPRESSLY
PROVIDED FOR IN THIS AGREEMENT, GOOGLE MAKES NO OTHER WARRANTY OF ANY KIND,
WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT
LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR USE AND
NON-INFRINGEMENT. THE SERVICE IS PROVIDED "AS IS".

## 11. LIMITATION OF LIABILITY.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, GOOGLE WILL NOT BE LIABLE
FOR YOUR LOST PROFITS (WHETHER DIRECT OR INDIRECT) OR INDIRECT, SPECIAL,
INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE LOSSES OR DAMAGES (WHETHER
OR NOT FORESEEABLE OR CONTEMPLATED BY THE PARTIES), EVEN IF GOOGLE OR ITS
AFFILIATES HAVE BEEN ADVISED OF, KNEW OR SHOULD HAVE KNOWN THAT SUCH
DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY.
GOOGLE AND ITS AFFILIATES' TOTAL CUMULATIVE LIABILITY TO YOU OR ANY OTHER PARTY
FOR ANY LOSS OR DAMAGES RESULTING FROM CLAIMS, DEMANDS, OR ACTIONS ARISING
OUT OF OR RELATING TO THIS AGREEMENT WILL NOT EXCEED $500 (USD).

## 12. Proprietary Rights Notice.

The Service, which includes the Software and all intellectual property rights therein are, and will
remain, the property of Google and its Affiliates. All rights in and to the Software not expressly
granted to You in this Agreement are reserved and retained by Google, its Affiliates, and its
licensors without restriction, including, Google's (and its Affiliates') right to sole ownership of
the Software and Documentation. Without limiting the generality of the foregoing, You agree, to
the maximum extent permitted by applicable law, not to (and not to allow any third party to): (a)
sublicense, distribute, or use the Service or Software outside of the scope of the license
granted in this Agreement; (b) copy, modify, adapt, translate, prepare derivative works from,
reverse engineer, disassemble, or decompile the Software or Documentation or otherwise
attempt to discover any source code or trade secrets related to the Service; (c) rent, lease, sell,
assign or otherwise transfer rights in or to the Software, the Documentation or the Service; (d)
use, post, transmit or introduce any device, software or routine which interferes or attempts to
interfere with the operation of the Service or the Software; (e) use the trademarks, trade
names, service marks, logos, domain names and other distinctive brand features or any
copyright or other proprietary rights associated with the Service for any purpose without the

express written consent of Google and its Affiliates ; (f) register, attempt to register, or assist anyone else to register any trademark, trade name, serve marks, logos, domain names and other distinctive brand features, copyright or other proprietary rights associated with Google or its Affiliates other than in the name of Google (or its Affiliates as the case may be); (g) remove, obscure, or alter any notice of copyright, trademark, or other proprietary right appearing in or on any item included with the Service or Software or (h) seek, in a proceeding filed during the term of this Agreement or for one year after such term, an injunction of any portion of the Service based on patent infringement.

## 13. U.S. Government Rights.

If the use of the Service is being acquired by or on behalf of the U.S. Government or by a U.S. Government prime contractor or subcontractor (at any tier), in accordance with 48 C.F.R. 227.7202-4 (for Department of Defense (DOD) acquisitions) and 48 C.F.R. 2.101 and 12.212 (for non-DOD acquisitions), the Government's rights in the Software, including its rights to use, modify, reproduce, release, perform, display or disclose the Software or Documentation, will be subject in all respects to the commercial license rights and restrictions provided in this Agreement.

## 14. Term and Termination.

Either party may terminate this Agreement at any time with notice. Upon any termination of this Agreement, Google will stop providing, and You will stop using the Service. In the event of any termination (a) You will not be entitled to any refunds of any usage fees or any other fees, and (b) any outstanding balance for Service rendered through the date of termination will be immediately due and payable in full and (c) all of Your historical Report data will no longer be available to You.

## 15. Modifications to Terms of Service and Other Policies.

Google may modify these terms or any additional terms that apply to the Service to, for example, reflect changes to the law or changes to the Service. You should look at the terms regularly. Google will post notice of modifications to these terms at firebase.google.com/terms/analytics (//firebase.google.com/terms/analytics),the Google Analytics for Firebase Policies at firebase.google.com/policies/analytics (//firebase.google.com/policies/analytics), or other policies referenced in these terms at the applicable URL for such policies. Changes will not apply retroactively and will become effective

no sooner than 14 days after they are posted. If You do not agree to the modified terms for the Service, You should discontinue Your use of the Service. No amendment to or modification of this Agreement will be binding unless (i) in writing and signed by a duly authorized representative of Google, (ii) You accept updated terms online, or (iii) You continue to use the Service after Google has posted updates to the Agreement or to any policy governing the Service.

## 16. Applicable Law and Venue.

(a) Except as set forth in Sections 16(b) and (c) below, all claims arising out of or relating to this Agreement or the Services ("Disputes") will be governed by California law, excluding California's conflict of laws rules, and all Disputes will be litigated exclusively in the federal or state courts of Santa Clara County, California, USA, and You and Google consent to personal jurisdiction in those courts.

(b) If Your principal place of business (for entities) or place of residence (for individuals) is in any country within APAC (other than Australia, Japan, New Zealand or Singapore) or Latin America, this Section 16(b) will apply instead of Section 16(a) above. ALL DISPUTES (AS DEFINED ABOVE) WILL BE GOVERNED BY CALIFORNIA LAW, EXCLUDING CALIFORNIA'S CONFLICT OF LAWS RULES. The parties will try in good faith to settle any Dispute within 30 days after the Dispute arises. If the Dispute is not resolved within 30 days, it must be resolved by arbitration by the American Arbitration Association's International Centre for Dispute Resolution in accordance with its Expedited Commercial Rules in force as of the date of this Agreement ("Rules"). The parties will mutually select one arbitrator. The arbitration will be conducted in English in Santa Clara County, California, USA. Either party may apply to any competent court for injunctive relief necessary to protect its rights pending resolution of the arbitration. The arbitrator may order equitable or injunctive relief consistent with the remedies and limitations in this Agreement. Subject to the confidentiality requirements in Section 5, either party may petition any competent court to issue any order necessary to protect that party's rights or property; this petition will not be considered a violation or waiver of this governing law and arbitration section and will not affect the arbitrator's powers, including the power to review the judicial decision. The parties stipulate that the courts of Santa Clara County, California, USA, are competent to grant any order under this subsection. The arbitral award will be final and binding on the parties and its execution may be presented in any competent court, including any court with jurisdiction over either party or any of its property. Any arbitration proceeding conducted in accordance with this section will be considered Confidential Information under this Agreement's confidentiality section, including (i) the existence of, (ii) any information disclosed during, and (iii) any oral communications or

documents related to the arbitration proceedings. The parties may also disclose the information described in this section to a competent court as may be necessary to file any order under this section or execute any arbitral decision, but the parties must request that those judicial proceedings be conducted in camera (in private). The parties will pay the arbitrator's fees, the arbitrator's appointed experts' fees and expenses, and the arbitration center's administrative expenses in accordance with the Rules. In its final decision, the arbitrator will determine the non-prevailing party's obligation to reimburse the amount paid in advance by the prevailing party for these fees. Each party will bear its own lawyers' and experts' fees and expenses, regardless of the arbitrator's final decision.

(c) If Your principal place of business (for entities) or place of residence (for individuals) is in Greece, all Disputes (as defined above) will be governed by Greek law and the parties submit to the exclusive jurisdiction of the courts of Athens in relation to any Dispute.

## 17. Miscellaneous

Google and its Affiliates will be excused from performance in this Agreement to the extent that performance is prevented, delayed or obstructed by causes beyond its reasonable control. This Agreement (including any amendment agreed upon by the parties in writing) represents the complete agreement between You and Google concerning its subject matter, and supersedes all prior agreements and representations between the parties. If any provision of this Agreement is held to be unenforceable for any reason, such provision will be reformed to the extent necessary to make it enforceable to the maximum extent permissible so as to effect the intent of the parties, and the remainder of this Agreement will continue in full force and effect. Certain laws of the jurisdiction in which you reside may confer rights and remedies and imply terms into this Agreement that cannot be excluded. Those rights, remedies, and implied terms are not excluded by this Agreement. To the extent that the relevant laws permit Google to limit their operation, Google's liability under those laws will be limited at its option, to the supply of the services again, or payment of the cost of having the services supplied again. The United Nations Convention on Contracts for the International Sale of Goods and the Uniform Computer Information Transactions Act do not apply to this Agreement. The Software is controlled by U.S. Export Regulations, and it may be not be exported to or used by embargoed countries or individuals. Any notices to Google must be sent to: Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA, with a copy to Legal Department, via first class or air mail or overnight courier, and are deemed given upon receipt. A waiver of any default is not a waiver of any subsequent default. You may not assign or otherwise transfer any of Your rights in this Agreement without Google's prior written consent, and any such attempt is void. Google may assign or otherwise transfer this Agreement to any of its Affiliates.

The relationship between Google and You is not one of a legal partnership relationship, but is one of independent contractors. This Agreement will be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. The following sections of this Agreement will survive any termination thereof: 1, 4, 5, 6 , 7, 8, 9, 10, 11, 12, 14, 16 and 17.

## Previous versions

- May 17, 2017 (/terms/analytics/20170517)

- May 18, 2016 (/terms/analytics/20160518)

# EXHIBIT 02-A

(https://google.com/racialequity)

# Google Analytics for Firebase Use Policy

**Last modified: December 20, 2019** | Previous versions (#previous_versions)

We have modified the Terms of Service and Policies to replace the term "Firebase Analytics" with "Google Ana
ebase."

==By enabling Google Analytics for Firebase you enable the collection of data about App Users, including via identifiers for mobile devices== (//www.google.com/policies/technologies/ads/) ==(including Android Advertising ID and Advertising Identifier for iOS), cookies and similar technologies.==

You ==will not facilitate the merging of personally-identifiable information with non-personally identifiable information unless you have robust notice of, and the user's prior affirmative (i.e., opt-in) consent to, that merger.==

You are required to notify your App Users by disclosing the following information:

- The Google Analytics for Firebase features you have implemented.

- How you and third-party vendors use first-party cookies, or other first-party identifiers, and third-party cookies and similar technologies, such as identifiers for mobile devices (including Android Advertising ID and Advertising Identifier for iOS), or other third-party identifiers, together.

- How App Users can opt-out of the Google Analytics for Firebase features you use, including through applicable device settings, such as the device advertising settings for mobile apps, or any other available means.

## European Union User Consent Policy

You must comply with the European Union User Consent Policy (//www.google.com/about/company/user-consent-policy.html).

# Interest-based advertising

If you use Google Analytics for Firebase to collect sensitive information about your visitors, including information described in the Google AdWords sensitive category restrictions (//support.google.com/adwordspolicy/answer/143465#sensitive), you may not use Google Analytics for Firebase to collect data for the purpose of interest based advertising.

Because laws across countries and territories vary, and because Google Analytics for Firebase can be used in many ways, Google is unable to provide the exact language you need to include in your privacy policy. Only you understand the unique aspects and special considerations of your business, and your privacy policy should account for this information that only you can provide.

# Policy Against Fingerprints and Locally Shared Objects

You must comply with the Policy Against Fingerprints and Locally Shared Objects (//support.google.com/analytics/answer/9682282).

# Previous versions

- May 17, 2017 (/policies/analytics/2017-05-17)

- May 18, 2016 (/policies/analytics/2016-05-18)

Last updated 2020-08-21 UTC.

# EXHIBIT 02-B

(https://google.com/racialequity)

# Google Analytics for Firebase Use Policy

This is an archive. For the current version of this page, head to Google Analytics for Firebase Use Policy
cies/analytics).

**Last updated: May 17, 2017**

We have modified the Terms of Service and Policies to replace the term "Firebase Analytics" with "Google Ana
ebase."

By enabling Google Analytics for Firebase you enable the collection of data about App Users, including via identifiers for mobile devices (//www.google.com/policies/technologies/ads/) (including Android Advertising ID and Advertising Identifier for iOS), cookies and similar technologies.

You will not facilitate the merging of personally-identifiable information with non-personally identifiable information unless you have robust notice of, and the user's prior affirmative (i.e., opt-in) consent to, that merger.

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- How App Users can opt-out of the Google Analytics for Firebase features you use, including through applicable device settings, such as the device advertising settings for mobile apps, or any other available means.

# European Union User Consent Policy

You must comply with the <u>European Union User Consent Policy</u>
 (//www.google.com/about/company/user-consent-policy.html).

# Interest-based advertising

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 (//support.google.com/adwordspolicy/answer/143465#sensitive), you may not use Google Analytics for Firebase to collect data for the purpose of interest based advertising.

Because laws across countries and territories vary, and because Google Analytics for Firebase can be used in many ways, Google is unable to provide the exact language you need to include in your privacy policy. Only you understand the unique aspects and special considerations of your business, and your privacy policy should account for this information that only you can provide.

Last Updated: 2017/05/17 (<u>View the archived version</u> (/policies/analytics/2016-05-18))

# Appendix A-2

**Google Analytics for Firebase Terms of Service, last updated May 18, 2016, downloaded on March 28, 2024, available at: https://web.archive.org/web/20170307063138/https://firebase.google.com/terms/analytics**

The Wayback Machine - https://web.archive.org/web/20170307063138/https://firebase.goog…

# FIREBASE ANALYTICS TERMS OF SERVICE

These Firebase Analytics Terms of Service, the Firebase Analytics Policies
 (//web.archive.org/web/20170307063138/https://firebase.google.com/policies/analytics) and the
Google API Terms of Service
 (//web.archive.org/web/20170307063138/https://developers.google.com/terms/) (this **"Agreement"**)
are entered into by Google and the entity or individual using the Service (**"You"**). This
Agreement governs Your use of Firebase Analytics (the **"Service"**). BY CLICKING THE "I
ACCEPT" BUTTON, COMPLETING THE REGISTRATION PROCESS, OR USING THE SERVICE,
YOU ACKNOWLEDGE THAT YOU HAVE REVIEWED AND ACCEPT THIS AGREEMENT AND ARE
AUTHORIZED TO ACT ON BEHALF OF, AND BIND TO THIS AGREEMENT, THE OWNER OF THIS
ACCOUNT. In consideration of the foregoing, the parties agree as follows:

## 1. Definitions.

**"Account"** refers to the account for the Service.

**"Affiliate(s)"** means in relation to each of the parties: (a) any parent company of that party; and
(b) any corporate body of which that party directly or indirectly has control or which is directly
or indirectly controlled by the same person or group of persons as that party.

**"Confidential Information"** includes any proprietary data and any other information disclosed
by one party to the other in writing and marked "confidential" or disclosed orally and, within five
business days, reduced to writing and marked "confidential". However, Confidential Information
will not include any information that is or becomes known to the general public, which is
already in the receiving party's possession prior to disclosure by a party or which is
independently developed by the receiving party without the use of Confidential Information.

**"Customer Data"** means the data You collect, process or store using the Service concerning the
characteristics and activities of Users.

**"Documentation"** means any accompanying documentation made available to You by Google
for use with the Processing Software, including any documentation available online.

**"Google"** means either (i) Google Ireland Limited, with offices at Gordon House, Barrow Street, Dublin 4, Ireland, if Your principal place of business (for entities) or place of residence (for individuals) is in any country within Europe, the Middle East, or Africa ("EMEA"), (ii) Google Asia Pacific Pte. Ltd., with offices at 8 Marina View Asia Square 1 #30-01 Singapore 018960, if Your principal place of business (for entities) or place of residence (for individuals) is in any country within the Asia Pacific region ("APAC"), or (iii) Google Inc., with offices at 1600 Amphitheatre Parkway, Mountain View, California 94043, if Your principal place of business (for entities) or place of residence (for individuals) is in any country in the world other than those in EMEA and APAC.

**"SDK"** means the Firebase Analytics Software Development Kit, which is used or incorporated in an App for the purpose of collecting Customer Data, together with any fixes, updates and upgrades provided to You.

**"Processing Software"** means the Google server-side software and any upgrades, which analyzes the Customer Data and generates the Reports.

**"App"** means any app or other resource that sends data to the Service. Each App must be under Your control.

**"Privacy Policy"** means the privacy policy on an App.

**"Report"** means the resulting analysis made available to You.

**"Servers"** means the servers controlled by Google or its Affiliates on which the Processing Software and Customer Data are stored.

**"Software"** means the SDK and the Processing Software.

**"Third Party"** means any third party (i) to which You provide access to Your Account or (i) for which You use the Service to collect information on the third party's behalf.

**"Users"** means users of Your Apps.

The words **"include"** and **"including"** mean "including but not limited to."

## 2. Fees and Service.

Google and its Affiliates may change its fees and payment policies for the Service from time to time. The changes to the fees or payment policies are effective upon Your acceptance of those changes which will be posted at firebase.google.com/terms/analytics. Unless otherwise

stated, all fees are quoted in U.S. Dollars. Any outstanding balance becomes immediately due and payable upon termination of this Agreement and any collection expenses (including attorneys' fees) incurred by Google and its Affiliates will be included in the amount owed, and may be charged to the credit card or other billing mechanism associated with Your AdWords account.

## 3. Member Account, Password, and Security.

To register for the Service, You must be acting in the course of business, complete the registration process by providing Google with current, complete and accurate information as prompted by the registration form, including Your e-mail address (username) and password. You will protect Your passwords and take full responsibility for Your own, and third party, use of Your accounts. You are solely responsible for any and all activities that occur under Your Account. You will notify Google immediately upon learning of any unauthorized use of Your Account or any other breach of security. Google or its Affiliates' support staff may, from time to time, log in to the Service under Your Account in order to maintain or improve service, including to provide You assistance with technical or billing issues. By creating Your Account you agree to receive electronic statements from Google and its Affiliates.

## 4. Nonexclusive License.

Subject to the terms and conditions of this Agreement, (a) Google grants You a limited, revocable, non-exclusive, non-sublicensable license to install, copy and use the SDK solely as necessary for You to use the Service on Your Apps or Third Parties Apps; and (b) You may remotely access, view and download Your Reports. You will not (and You will not allow any third party to) use data labeled as belonging to a third party in the Service for purposes other than generating, viewing, and downloading Reports. You will comply with all applicable laws and regulations and Your agreements with third parties in Your use of and access to the Documentation, Software, Service and Reports.

## 5. Confidentiality.

Neither party will use or disclose the other party's Confidential Information without the other's prior written consent except for the purpose of performing its obligations under this Agreement or if required by law, regulation or court order; in which case, the party being compelled to disclose Confidential Information will give the other party as much notice as is reasonably practicable prior to disclosing the Confidential Information if permitted by law.

## 6. Information Rights and Publicity.

Google and and its Affiliates may retain and use, subject to the terms of its privacy policy (located at www.google.com/privacy.html), information collected in Your use of the Service. Google will not share Your Customer Data or any Third Party's Customer Data with any third parties unless Google (i) has Your consent for any Customer Data or any Third Party's consent for the Third Party's Customer Data; (ii) concludes that it is required by law or has a good faith belief that access, preservation or disclosure of Customer Data is reasonably necessary to protect the rights, property or safety of Google, its users or the public; or (iii) provides Customer Data in certain limited circumstances to third parties to carry out tasks on Google's behalf (e.g., billing or data storage) with strict restrictions that prevent the data from being used or shared except as directed by Google. When this is done, it is subject to agreements that oblige those parties to process Customer Data only on Google's instructions and in compliance with this Agreement and appropriate confidentiality and security measures.

## 7. Privacy.

You will not, and will not assist or permit any third party to, pass information to Google that Google could use or recognize as personally identifiable information. You will have and abide by an appropriate Privacy Policy and will comply with all applicable laws, policies, and regulations relating to the collection, usage and sharing of information from Users. You must post a Privacy Policy and that Privacy Policy must provide notice of Your use of cookies, identifiers for mobile devices (e.g., Android Advertising Identifier or Advertising Identifier for iOS) or similar technology that are used to collect data. You must disclose the use of the Service, and how it collects and processes data. This can be done by displaying a prominent link to the site "How Google uses data when you use our partners' sites or apps", (located at www.google.com/policies/privacy/partners/, or any other URL Google may provide from time to time). You will use commercially reasonable efforts to ensure that a User is provided with clear and comprehensive information about, and consents to, the storing and accessing of cookies or other information on the User's device where such activity occurs in connection with the Service and where providing such information and obtaining such consent is required by law.

You must not circumvent any privacy features that are part of the Service.

Your access to and use of any other DoubleClick or Google service is subject to the applicable terms between You and Google regarding that service.

FIREBASE ANALYTICS TERMS OF SERVICE  |  Firebase

## 8. Indemnification.

To the maximum extent permitted by applicable law, You will indemnify, hold harmless and defend Google and its Affiliates, at Your expense, from any and all third-party claims, actions, proceedings, and suits brought against Google or any of its officers, directors, employees, agents or Affiliates, and all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, reasonable attorneys' fees and other litigation expenses) incurred by Google or any of its officers, directors, employees, agents or Affiliates, arising out of or relating to (i) Your breach of any term or condition of this Agreement, (ii) Your use of the Service, (iii) Your violations of applicable laws, rules or regulations in connection with the Service, (iv) any representations and warranties made by You concerning any aspect of the Service, the Software or Reports to any Third Party; (v) any claims made by or on behalf of any Third Party pertaining directly or indirectly to Your use of the Service, the Software or Reports; (vi) violations of Your obligations of privacy to any Third Party; and (vii) any claims with respect to acts or omissions of any Third Party in connection with the Service, the Software or Reports. Google will provide You with written notice of any claim, suit or action from which You must indemnify Google and its Affiliates. You will cooperate as fully as reasonably required in the defense of any claim. Google and its Affiliates reserve the right, at their own expense, to assume the exclusive defense and control of any matter subject to indemnification by You.

## 9. Third Parties.

If You use the Service on behalf of a Third Party or a Third Party otherwise uses the Service through Your Account, whether or not You are authorized by Google to do so, then You represent and warrant that (a) You are authorized to act on behalf of, and bind to this Agreement, the Third Party to all obligations that You have under this Agreement, (b) Google and its Affiliates may share with the Third Party any Customer Data that is specific to the Third Party's Apps, and (c) You will not disclose Third Party's Customer Data to any other party without the Third Party's consent.

## 10. DISCLAIMER OF WARRANTIES.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT AS EXPRESSLY PROVIDED FOR IN THIS AGREEMENT, GOOGLE MAKES NO OTHER WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR USE AND NON-INFRINGEMENT. THE SERVICE IS PROVIDED "AS IS".

## 11. LIMITATION OF LIABILITY.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, GOOGLE WILL NOT BE LIABLE FOR YOUR LOST PROFITS (WHETHER DIRECT OR INDIRECT) OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE LOSSES OR DAMAGES (WHETHER OR NOT FORESEEABLE OR CONTEMPLATED BY THE PARTIES), EVEN IF GOOGLE OR ITS AFFILIATES HAVE BEEN ADVISED OF, KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY. GOOGLE AND ITS AFFILIATES' TOTAL CUMULATIVE LIABILITY TO YOU OR ANY OTHER PARTY FOR ANY LOSS OR DAMAGES RESULTING FROM CLAIMS, DEMANDS, OR ACTIONS ARISING OUT OF OR RELATING TO THIS AGREEMENT WILL NOT EXCEED $500 (USD).

## 12. Proprietary Rights Notice.

The Service, which includes the Software and all intellectual property rights therein are, and will remain, the property of Google and its Affiliates. All rights in and to the Software not expressly granted to You in this Agreement are reserved and retained by Google, its Affiliates, and its licensors without restriction, including, Google's (and its Affiliates') right to sole ownership of the Software and Documentation. Without limiting the generality of the foregoing, You agree, to the maximum extent permitted by applicable law, not to (and not to allow any third party to): (a) sublicense, distribute, or use the Service or Software outside of the scope of the license granted in this Agreement; (b) copy, modify, adapt, translate, prepare derivative works from, reverse engineer, disassemble, or decompile the Software or Documentation or otherwise attempt to discover any source code or trade secrets related to the Service; (c) rent, lease, sell, assign or otherwise transfer rights in or to the Software, the Documentation or the Service; (d) use, post, transmit or introduce any device, software or routine which interferes or attempts to interfere with the operation of the Service or the Software; (e) use the trademarks, trade names, service marks, logos, domain names and other distinctive brand features or any copyright or other proprietary rights associated with the Service for any purpose without the express written consent of Google and its Affiliates ; (f) register, attempt to register, or assist anyone else to register any trademark, trade name, serve marks, logos, domain names and other distinctive brand features, copyright or other proprietary rights associated with Google or its Affiliates other than in the name of Google (or its Affiliates as the case may be); (g) remove, obscure, or alter any notice of copyright, trademark, or other proprietary right appearing in or on any item included with the Service or Software or (h) seek, in a proceeding filed during the term of this Agreement or for one year after such term, an injunction of any portion of the Service based on patent infringement.

## 13. U.S. Government Rights.

If the use of the Service is being acquired by or on behalf of the U.S. Government or by a U.S. Government prime contractor or subcontractor (at any tier), in accordance with 48 C.F.R. 227.7202-4 (for Department of Defense (DOD) acquisitions) and 48 C.F.R. 2.101 and 12.212 (for non-DOD acquisitions), the Government's rights in the Software, including its rights to use, modify, reproduce, release, perform, display or disclose the Software or Documentation, will be subject in all respects to the commercial license rights and restrictions provided in this Agreement.

## 14. Term and Termination.

Either party may terminate this Agreement at any time with notice. Upon any termination of this Agreement, Google will stop providing, and You will stop using the Service. In the event of any termination (a) You will not be entitled to any refunds of any usage fees or any other fees, and (b) any outstanding balance for Service rendered through the date of termination will be immediately due and payable in full and (c) all of Your historical Report data will no longer be available to You.

## 15. Modifications to Terms of Service and Other Policies.

Google may modify these terms or any additional terms that apply to the Service to, for example, reflect changes to the law or changes to the Service. You should look at the terms regularly. Google will post notice of modifications to these terms at firebase.google.com/terms/analytics
 (//web.archive.org/web/20170307063138/https://firebase.google.com/terms/analytics), the Firebase Analytics Policies at firebase.google.com/policies/analytics
 (//web.archive.org/web/20170307063138/https://firebase.google.com/policies/analytics), or other policies referenced in these terms at the applicable URL for such policies. Changes will not apply retroactively and will become effective no sooner than 14 days after they are posted. If You do not agree to the modified terms for the Service, You should discontinue Your use of the Service. No amendment to or modification of this Agreement will be binding unless (i) in writing and signed by a duly authorized representative of Google, (ii) You accept updated terms online, or (iii) You continue to use the Service after Google has posted updates to the Agreement or to any policy governing the Service.

## 16. Applicable Law and Venue.

(a) Except as set forth in Sections 16(b) and (c) below, all claims arising out of or relating to this Agreement or the Services ("Disputes") will be governed by California law, excluding California's conflict of laws rules, and all Disputes will be litigated exclusively in the federal or state courts of Santa Clara County, California, USA, and You and Google consent to personal jurisdiction in those courts.

(b) If Your principal place of business (for entities) or place of residence (for individuals) is in any country within APAC (other than Australia, Japan, New Zealand or Singapore) or Latin America, this Section 16(b) will apply instead of Section 16(a) above. ALL DISPUTES (AS DEFINED ABOVE) WILL BE GOVERNED BY CALIFORNIA LAW, EXCLUDING CALIFORNIA'S CONFLICT OF LAWS RULES. The parties will try in good faith to settle any Dispute within 30 days after the Dispute arises. If the Dispute is not resolved within 30 days, it must be resolved by arbitration by the American Arbitration Association's International Centre for Dispute Resolution in accordance with its Expedited Commercial Rules in force as of the date of this Agreement ("Rules"). The parties will mutually select one arbitrator. The arbitration will be conducted in English in Santa Clara County, California, USA. Either party may apply to any competent court for injunctive relief necessary to protect its rights pending resolution of the arbitration. The arbitrator may order equitable or injunctive relief consistent with the remedies and limitations in this Agreement. Subject to the confidentiality requirements in Section 5, either party may petition any competent court to issue any order necessary to protect that party's rights or property; this petition will not be considered a violation or waiver of this governing law and arbitration section and will not affect the arbitrator's powers, including the power to review the judicial decision. The parties stipulate that the courts of Santa Clara County, California, USA, are competent to grant any order under this subsection. The arbitral award will be final and binding on the parties and its execution may be presented in any competent court, including any court with jurisdiction over either party or any of its property. Any arbitration proceeding conducted in accordance with this section will be considered Confidential Information under this Agreement's confidentiality section, including (i) the existence of, (ii) any information disclosed during, and (iii) any oral communications or documents related to the arbitration proceedings. The parties may also disclose the information described in this section to a competent court as may be necessary to file any order under this section or execute any arbitral decision, but the parties must request that those judicial proceedings be conducted in camera (in private). The parties will pay the arbitrator's fees, the arbitrator's appointed experts' fees and expenses, and the arbitration center's administrative expenses in accordance with the Rules. In its final decision, the arbitrator will determine the non-prevailing party's obligation to reimburse the amount paid in

advance by the prevailing party for these fees. Each party will bear its own lawyers' and experts' fees and expenses, regardless of the arbitrator's final decision.

(c) If Your principal place of business (for entities) or place of residence (for individuals) is in Greece, all Disputes (as defined above) will be governed by Greek law and the parties submit to the exclusive jurisdiction of the courts of Athens in relation to any Dispute.

## 17. Miscellaneous

Google and its Affiliates will be excused from performance in this Agreement to the extent that performance is prevented, delayed or obstructed by causes beyond its reasonable control. This Agreement (including any amendment agreed upon by the parties in writing) represents the complete agreement between You and Google concerning its subject matter, and supersedes all prior agreements and representations between the parties. If any provision of this Agreement is held to be unenforceable for any reason, such provision will be reformed to the extent necessary to make it enforceable to the maximum extent permissible so as to effect the intent of the parties, and the remainder of this Agreement will continue in full force and effect. Certain laws of the jurisdiction in which you reside may confer rights and remedies and imply terms into this Agreement that cannot be excluded. Those rights, remedies, and implied terms are not excluded by this Agreement. To the extent that the relevant laws permit Google to limit their operation, Google's liability under those laws will be limited at its option, to the supply of the services again, or payment of the cost of having the services supplied again. The United Nations Convention on Contracts for the International Sale of Goods and the Uniform Computer Information Transactions Act do not apply to this Agreement. The Software is controlled by U.S. Export Regulations, and it may be not be exported to or used by embargoed countries or individuals. Any notices to Google must be sent to: Google Inc., 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA, with a copy to Legal Department, via first class or air mail or overnight courier, and are deemed given upon receipt. A waiver of any default is not a waiver of any subsequent default. You may not assign or otherwise transfer any of Your rights in this Agreement without Google's prior written consent, and any such attempt is void. Google may assign or otherwise transfer this Agreement to any of its Affiliates. The relationship between Google and You is not one of a legal partnership relationship, but is one of independent contractors. This Agreement will be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. The following sections of this Agreement will survive any termination thereof: 1, 4, 5, 6 , 7, 8, 9, 10, 11, 12, 14, 16 and 17.

Last Updated: 2016/05/18

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**Google Analytics for Firebase Terms of Service, last updated May 17, 2017, downloaded on March 28, 2024, available at: https://web.archive.org/web/20200812055821/https://firebase.google.com/terms/analytics/20170517**

**Google is committed to advancing racial equity for Black communities. <u>See how.</u>** (https://web.archive.org/web/20200812055821/https://google.com/racialequity)

# GOOGLE ANALYTICS FOR FIREBASE TERMS OF SERVICE

This is an archive. For the current version of this page, head to <u>Google Analytics for Firebase Terms of Service</u> /20200812055821/https://firebase.google.com/terms/analytics).

**Terms last modified: May 17, 2017**

These Google Analytics for Firebase Terms of Service, the <u>Google Analytics for Firebase Policies</u> (/web/20200812055821/https://firebase.google.com/policies/analytics) and the <u>Google API Terms of Service</u> (//web.archive.org/web/20200812055821/https://developers.google.com/terms/) (this **"Agreement"**) are entered into by Google and the entity or individual using the Service (**"You"**). This Agreement governs Your use of Google Analytics for Firebase (the **"Service"**). BY CLICKING THE "I ACCEPT" BUTTON, COMPLETING THE REGISTRATION PROCESS, OR USING THE SERVICE, YOU ACKNOWLEDGE THAT YOU HAVE REVIEWED AND ACCEPT THIS AGREEMENT AND ARE AUTHORIZED TO ACT ON BEHALF OF, AND BIND TO THIS AGREEMENT, THE OWNER OF THIS ACCOUNT. In consideration of the foregoing, the parties agree as follows:

## 1. Definitions.

**"Account"** refers to the account for the Service.

**"Affiliate(s)"** means in relation to each of the parties: (a) any parent company of that party; and (b) any corporate body of which that party directly or indirectly has control or which is directly or indirectly controlled by the same person or group of persons as that party.

**"Confidential Information"** includes any proprietary data and any other information disclosed by one party to the other in writing and marked "confidential" or disclosed orally and, within five business days, reduced to writing and marked "confidential". However, Confidential Information will not include any information that is or becomes known to the general public, which is already in the receiving party's possession prior to disclosure by a party or which is independently developed by the receiving party without the use of Confidential Information.

**"Customer Data"** means the data You collect, process or store using the Service concerning the characteristics and activities of Users.

**"Documentation"** means any accompanying documentation made available to You by Google for use with the Processing Software, including any documentation available online.

**"Google"** means either (i) Google Ireland Limited, with offices at Gordon House, Barrow Street, Dublin 4, Ireland, if Your principal place of business (for entities) or place of residence (for individuals) is in any country within Europe, the Middle East, or Africa ("EMEA"), (ii) Google Asia Pacific Pte. Ltd., with offices at 70 Pasir Panjang Road, #03-01, Mapletree Business City II, Singapore 117371, if Your principal place of business (for entities) or place of residence (for individuals) is in any country within the Asia Pacific region ("APAC"), or (iii) Google LLC, with offices at 1600 Amphitheatre Parkway, Mountain View, California 94043, if Your principal place of business (for entities) or place of residence (for individuals) is in any country in the world other than those in EMEA and APAC.

**"SDK"** means the Firebase Software Development Kit, which is used or incorporated in an App for the purpose of collecting Customer Data, together with any fixes, updates and upgrades provided to You.

**"Processing Software"** means the Google server-side software and any upgrades, which analyzes the Customer Data and generates the Reports.

**"App"** means any app or other resource that sends data to the Service. Each App must be under Your control.

**"Privacy Policy"** means the privacy policy on an App.

**"Report"** means the resulting analysis made available to You.

**"Servers"** means the servers controlled by Google or its Affiliates on which the Processing Software and Customer Data are stored.

**"Software"** means the SDK and the Processing Software.

**"Third Party"** means any third party (i) to which You provide access to Your Account or (i) for which You use the Service to collect information on the third party's behalf.

**"Users"** means users of Your Apps.

The words **"include"** and **"including"** mean "including but not limited to."

## 2. Fees and Service.

Google and its Affiliates may change its fees and payment policies for the Service from time to time. The changes to the fees or payment policies are effective upon Your acceptance of those changes

which will be posted at firebase.google.com/terms/analytics. Unless otherwise stated, all fees are quoted in U.S. Dollars. Any outstanding balance becomes immediately due and payable upon termination of this Agreement and any collection expenses (including attorneys' fees) incurred by Google and its Affiliates will be included in the amount owed, and may be charged to the credit card or other billing mechanism associated with Your AdWords account.

## 3. Member Account, Password, and Security.

To register for the Service, You must be acting in the course of business, complete the registration process by providing Google with current, complete and accurate information as prompted by the registration form, including Your e-mail address (username) and password. You will protect Your passwords and take full responsibility for Your own, and third party, use of Your accounts. You are solely responsible for any and all activities that occur under Your Account. You will notify Google immediately upon learning of any unauthorized use of Your Account or any other breach of security. Google or its Affiliates' support staff may, from time to time, log in to the Service under Your Account in order to maintain or improve service, including to provide You assistance with technical or billing issues. By creating Your Account you agree to receive electronic statements from Google and its Affiliates.

## 4. Nonexclusive License.

Subject to the terms and conditions of this Agreement, (a) Google grants You a limited, revocable, non-exclusive, non-sublicensable license to install, copy and use the SDK solely as necessary for You to use the Service on Your Apps or Third Parties Apps; and (b) You may remotely access, view and download Your Reports. You will not (and You will not allow any third party to) use data labeled as belonging to a third party in the Service for purposes other than generating, viewing, and downloading Reports. You will comply with all applicable laws and regulations and Your agreements with third parties in Your use of and access to the Documentation, Software, Service and Reports.

## 5. Confidentiality.

Neither party will use or disclose the other party's Confidential Information without the other's prior written consent except for the purpose of performing its obligations under this Agreement or if required by law, regulation or court order; in which case, the party being compelled to disclose Confidential Information will give the other party as much notice as is reasonably practicable prior to disclosing the Confidential Information if permitted by law.

## 6. Information Rights and Publicity.

Google and its Affiliates may retain and use, subject to the terms of its privacy policy (located at www.google.com/privacy.html), information collected in Your use of the Service. Google will not share Your Customer Data or any Third Party's Customer Data with any third parties unless Google (i) has Your consent for any Customer Data or any Third Party's consent for the Third Party's Customer Data; (ii) concludes that it is required by law or has a good faith belief that access, preservation or disclosure of Customer Data is reasonably necessary to protect the rights, property or safety of Google, its users or the public; or (iii) provides Customer Data in certain limited circumstances to third parties to carry out tasks on Google's behalf (e.g., billing or data storage) with strict restrictions that prevent the data from being used or shared except as directed by Google. When this is done, it is subject to agreements that oblige those parties to process Customer Data only on Google's instructions and in compliance with this Agreement and appropriate confidentiality and security measures.

## 7. Privacy.

You will not, and will not assist or permit any third party to, pass information to Google that Google could use or recognize as personally identifiable information. You will have and abide by an appropriate Privacy Policy and will comply with all applicable laws, policies, and regulations relating to the collection, usage and sharing of information from Users. You must post a Privacy Policy and that Privacy Policy must provide notice of Your use of cookies, identifiers for mobile devices (e.g., Android Advertising Identifier or Advertising Identifier for iOS) or similar technology that are used to collect data. You must disclose the use of the Service, and how it collects and processes data. This can be done by displaying a prominent link to the site "How Google uses data when you use our partners' sites or apps", (located at www.google.com/policies/privacy/partners/, or any other URL Google may provide from time to time). You will use commercially reasonable efforts to ensure that a User is provided with clear and comprehensive information about, and consents to, the storing and accessing of cookies or other information on the User's device where such activity occurs in connection with the Service and where providing such information and obtaining such consent is required by law.

You must not circumvent any privacy features that are part of the Service.

Your access to and use of any other DoubleClick or Google service is subject to the applicable terms between You and Google regarding that service.

## 8. Indemnification.

To the maximum extent permitted by applicable law, You will indemnify, hold harmless and defend Google and its Affiliates, at Your expense, from any and all third-party claims, actions, proceedings, and suits brought against Google or any of its officers, directors, employees, agents or Affiliates, and

all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, reasonable attorneys' fees and other litigation expenses) incurred by Google or any of its officers, directors, employees, agents or Affiliates, arising out of or relating to (i) Your breach of any term or condition of this Agreement, (ii) Your use of the Service, (iii) Your violations of applicable laws, rules or regulations in connection with the Service, (iv) any representations and warranties made by You concerning any aspect of the Service, the Software or Reports to any Third Party; (v) any claims made by or on behalf of any Third Party pertaining directly or indirectly to Your use of the Service, the Software or Reports; (vi) violations of Your obligations of privacy to any Third Party; and (vii) any claims with respect to acts or omissions of any Third Party in connection with the Service, the Software or Reports. Google will provide You with written notice of any claim, suit or action from which You must indemnify Google and its Affiliates. You will cooperate as fully as reasonably required in the defense of any claim. Google and its Affiliates reserve the right, at their own expense, to assume the exclusive defense and control of any matter subject to indemnification by You.

## 9. Third Parties.

If You use the Service on behalf of a Third Party or a Third Party otherwise uses the Service through Your Account, whether or not You are authorized by Google to do so, then You represent and warrant that (a) You are authorized to act on behalf of, and bind to this Agreement, the Third Party to all obligations that You have under this Agreement, (b) Google and its Affiliates may share with the Third Party any Customer Data that is specific to the Third Party's Apps, and (c) You will not disclose Third Party's Customer Data to any other party without the Third Party's consent.

## 10. DISCLAIMER OF WARRANTIES.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT AS EXPRESSLY PROVIDED FOR IN THIS AGREEMENT, GOOGLE MAKES NO OTHER WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR USE AND NON-INFRINGEMENT. THE SERVICE IS PROVIDED "AS IS".

## 11. LIMITATION OF LIABILITY.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, GOOGLE WILL NOT BE LIABLE FOR YOUR LOST PROFITS (WHETHER DIRECT OR INDIRECT) OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE LOSSES OR DAMAGES (WHETHER OR NOT FORESEEABLE OR CONTEMPLATED BY THE PARTIES), EVEN IF GOOGLE OR ITS AFFILIATES HAVE BEEN ADVISED OF, KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY. GOOGLE AND ITS AFFILIATES' TOTAL

CUMULATIVE LIABILITY TO YOU OR ANY OTHER PARTY FOR ANY LOSS OR DAMAGES RESULTING FROM CLAIMS, DEMANDS, OR ACTIONS ARISING OUT OF OR RELATING TO THIS AGREEMENT WILL NOT EXCEED $500 (USD).

## 12. Proprietary Rights Notice.

The Service, which includes the Software and all intellectual property rights therein are, and will remain, the property of Google and its Affiliates. All rights in and to the Software not expressly granted to You in this Agreement are reserved and retained by Google, its Affiliates, and its licensors without restriction, including, Google's (and its Affiliates') right to sole ownership of the Software and Documentation. Without limiting the generality of the foregoing, You agree, to the maximum extent permitted by applicable law, not to (and not to allow any third party to): (a) sublicense, distribute, or use the Service or Software outside of the scope of the license granted in this Agreement; (b) copy, modify, adapt, translate, prepare derivative works from, reverse engineer, disassemble, or decompile the Software or Documentation or otherwise attempt to discover any source code or trade secrets related to the Service; (c) rent, lease, sell, assign or otherwise transfer rights in or to the Software, the Documentation or the Service; (d) use, post, transmit or introduce any device, software or routine which interferes or attempts to interfere with the operation of the Service or the Software; (e) use the trademarks, trade names, service marks, logos, domain names and other distinctive brand features or any copyright or other proprietary rights associated with the Service for any purpose without the express written consent of Google and its Affiliates ; (f) register, attempt to register, or assist anyone else to register any trademark, trade name, serve marks, logos, domain names and other distinctive brand features, copyright or other proprietary rights associated with Google or its Affiliates other than in the name of Google (or its Affiliates as the case may be); (g) remove, obscure, or alter any notice of copyright, trademark, or other proprietary right appearing in or on any item included with the Service or Software or (h) seek, in a proceeding filed during the term of this Agreement or for one year after such term, an injunction of any portion of the Service based on patent infringement.

## 13. U.S. Government Rights.

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## 15. Modifications to Terms of Service and Other Policies.

Google may modify these terms or any additional terms that apply to the Service to, for example, reflect changes to the law or changes to the Service. You should look at the terms regularly. Google will post notice of modifications to these terms at firebase.google.com/terms/analytics (//web.archive.org/web/20200812055821/https://firebase.google.com/terms/analytics), the Google Analytics for Firebase Policies at firebase.google.com/policies/analytics (//web.archive.org/web/20200812055821/https://firebase.google.com/policies/analytics), or other policies referenced in these terms at the applicable URL for such policies. Changes will not apply retroactively and will become effective no sooner than 14 days after they are posted. If You do not agree to the modified terms for the Service, You should discontinue Your use of the Service. No amendment to or modification of this Agreement will be binding unless (i) in writing and signed by a duly authorized representative of Google, (ii) You accept updated terms online, or (iii) You continue to use the Service after Google has posted updates to the Agreement or to any policy governing the Service.

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(a) Except as set forth in Sections 16(b) and (c) below, all claims arising out of or relating to this Agreement or the Services ("Disputes") will be governed by California law, excluding California's conflict of laws rules, and all Disputes will be litigated exclusively in the federal or state courts of Santa Clara County, California, USA, and You and Google consent to personal jurisdiction in those courts.

(b) If Your principal place of business (for entities) or place of residence (for individuals) is in any country within APAC (other than Australia, Japan, New Zealand or Singapore) or Latin America, this Section 16(b) will apply instead of Section 16(a) above. ALL DISPUTES (AS DEFINED ABOVE) WILL BE GOVERNED BY CALIFORNIA LAW, EXCLUDING CALIFORNIA'S CONFLICT OF LAWS RULES. The parties will try in good faith to settle any Dispute within 30 days after the Dispute arises. If the Dispute is not resolved within 30 days, it must be resolved by arbitration by the American Arbitration Association's International Centre for Dispute Resolution in accordance with its Expedited Commercial Rules in force as of the date of this Agreement ("Rules"). The parties will mutually select one arbitrator. The arbitration will be conducted in English in Santa Clara County, California, USA. Either party may apply to any competent court for injunctive relief necessary to protect its rights

pending resolution of the arbitration. The arbitrator may order equitable or injunctive relief consistent with the remedies and limitations in this Agreement. Subject to the confidentiality requirements in Section 5, either party may petition any competent court to issue any order necessary to protect that party's rights or property; this petition will not be considered a violation or waiver of this governing law and arbitration section and will not affect the arbitrator's powers, including the power to review the judicial decision. The parties stipulate that the courts of Santa Clara County, California, USA, are competent to grant any order under this subsection. The arbitral award will be final and binding on the parties and its execution may be presented in any competent court, including any court with jurisdiction over either party or any of its property. Any arbitration proceeding conducted in accordance with this section will be considered Confidential Information under this Agreement's confidentiality section, including (i) the existence of, (ii) any information disclosed during, and (iii) any oral communications or documents related to the arbitration proceedings. The parties may also disclose the information described in this section to a competent court as may be necessary to file any order under this section or execute any arbitral decision, but the parties must request that those judicial proceedings be conducted in camera (in private). The parties will pay the arbitrator's fees, the arbitrator's appointed experts' fees and expenses, and the arbitration center's administrative expenses in accordance with the Rules. In its final decision, the arbitrator will determine the non-prevailing party's obligation to reimburse the amount paid in advance by the prevailing party for these fees. Each party will bear its own lawyers' and experts' fees and expenses, regardless of the arbitrator's final decision.

(c) If Your principal place of business (for entities) or place of residence (for individuals) is in Greece, all Disputes (as defined above) will be governed by Greek law and the parties submit to the exclusive jurisdiction of the courts of Athens in relation to any Dispute.

## 17. Miscellaneous

Google and its Affiliates will be excused from performance in this Agreement to the extent that performance is prevented, delayed or obstructed by causes beyond its reasonable control. This Agreement (including any amendment agreed upon by the parties in writing) represents the complete agreement between You and Google concerning its subject matter, and supersedes all prior agreements and representations between the parties. If any provision of this Agreement is held to be unenforceable for any reason, such provision will be reformed to the extent necessary to make it enforceable to the maximum extent permissible so as to effect the intent of the parties, and the remainder of this Agreement will continue in full force and effect. Certain laws of the jurisdiction in which you reside may confer rights and remedies and imply terms into this Agreement that cannot be excluded. Those rights, remedies, and implied terms are not excluded by this Agreement. To the extent that the relevant laws permit Google to limit their operation, Google's liability under those laws will be limited at its option, to the supply of the services again, or payment of the cost of having the services supplied again. The United Nations Convention on Contracts for the International Sale of

Goods and the Uniform Computer Information Transactions Act do not apply to this Agreement. The Software is controlled by U.S. Export Regulations, and it may be not be exported to or used by embargoed countries or individuals. Any notices to Google must be sent to: Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA, with a copy to Legal Department, via first class or air mail or overnight courier, and are deemed given upon receipt. A waiver of any default is not a waiver of any subsequent default. You may not assign or otherwise transfer any of Your rights in this Agreement without Google's prior written consent, and any such attempt is void. Google may assign or otherwise transfer this Agreement to any of its Affiliates. The relationship between Google and You is not one of a legal partnership relationship, but is one of independent contractors. This Agreement will be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. The following sections of this Agreement will survive any termination thereof: 1, 4, 5, 6 , 7, 8, 9, 10, 11, 12, 14, 16 and 17.

Last Updated: 2017/05/17 (View the archived version
 (/web/20200812055821/https://firebase.google.com/terms/analytics/20160518))

# Google Analytics for Firebase Terms of Service, last updated October 1, 2018, downloaded on March 28, 2024, available at: https://web.archive.org/web/20200813203704/https://firebase.google.com/terms/analytics/20181001

The Wayback Machine - https://web.archive.org/web/20200813203704/https://firebase.goog...
 (https://web.archive.org/web/20200813203704/https://google.com/racialequity)

# GOOGLE ANALYTICS FOR FIREBASE TERMS OF SERVICE

This is an archive. For the current version of this page, head to Google Analytics for Firebase Terms of Service /20200813203704/https://firebase.google.com/terms/analytics).

**Terms last modified: Oct 1, 2018**

These Google Analytics for Firebase Terms of Service, the Google Analytics for Firebase Policies (/web/20200813203704/https://firebase.google.com/policies/analytics) and the Google API Terms of Service (//web.archive.org/web/20200813203704/https://developers.google.com/terms/) (this "**Agreement**") are entered into by Google and the entity or individual using the Service ("**You**"). This Agreement governs Your use of Google Analytics for Firebase (the "**Service**"). BY CLICKING THE "I ACCEPT" BUTTON, COMPLETING THE REGISTRATION PROCESS, OR USING THE SERVICE, YOU ACKNOWLEDGE THAT YOU HAVE REVIEWED AND ACCEPT THIS AGREEMENT AND ARE AUTHORIZED TO ACT ON BEHALF OF, AND BIND TO THIS AGREEMENT, THE OWNER OF THIS ACCOUNT. In consideration of the foregoing, the parties agree as follows:

## 1. Definitions.

"**Account**" refers to the account for the Service.

"**Affiliate(s)**" means in relation to each of the parties: (a) any parent company of that party; and (b) any corporate body of which that party directly or indirectly has control or which is directly or indirectly controlled by the same person or group of persons as that party.

"**Confidential Information**" includes any proprietary data and any other information disclosed by one party to the other in writing and marked "confidential" or disclosed orally and, within five business days, reduced to writing and marked "confidential". However, Confidential Information will not include any information that is or becomes known to the general public, which is

already in the receiving party's possession prior to disclosure by a party or which is independently developed by the receiving party without the use of Confidential Information.

**"Customer Data"** means the data You collect, process or store using the Service concerning the characteristics and activities of Users.

**"Documentation"** means any accompanying documentation made available to You by Google for use with the Processing Software, including any documentation available online.

**"Google"** means (i) Google Ireland Limited, with offices at Gordon House, Barrow Street, Dublin 4, Ireland, if Your principal place of business (for entities) or place of residence (for individuals) is in any country within Europe, the Middle East, or Africa ("EMEA"), (ii) Google Asia Pacific Pte. Ltd., with offices at 70 Pasir Panjang Road, #03-01, Mapletree Business City II, Singapore 117371 (or its affiliate reseller(s)), if Your principal place of business (for entities) or place of residence (for individuals) is in any country within the Asia Pacific region ("APAC"), or (iii) Google LLC, with offices at 1600 Amphitheatre Parkway, Mountain View, California 94043, if Your principal place of business (for entities) or place of residence (for individuals) is in any country in the world other than those in EMEA and APAC.

**"SDK"** means the Firebase Software Development Kit, which is used or incorporated in an App for the purpose of collecting Customer Data, together with any fixes, updates and upgrades provided to You.

**"Processing Software"** means the Google server-side software and any upgrades, which analyzes the Customer Data and generates the Reports.

**"App"** means any app or other resource that sends data to the Service. Each App must be under Your control.

**"Privacy Policy"** means the privacy policy on an App.

**"Report"** means the resulting analysis made available to You.

**"Servers"** means the servers controlled by Google or its Affiliates on which the Processing Software and Customer Data are stored.

**"Software"** means the SDK and the Processing Software.

**"Third Party"** means any third party (i) to which You provide access to Your Account or (i) for which You use the Service to collect information on the third party's behalf.

**"Users"** means users of Your Apps.

The words **"include"** and **"including"** mean "including but not limited to."

## 2. Fees and Service.

Google and its Affiliates may change its fees and payment policies for the Service from time to time. The changes to the fees or payment policies are effective upon Your acceptance of those changes which will be posted at firebase.google.com/terms/analytics. Unless otherwise stated, all fees are quoted in U.S. Dollars. Any outstanding balance becomes immediately due and payable upon termination of this Agreement and any collection expenses (including attorneys' fees) incurred by Google and its Affiliates will be included in the amount owed, and may be charged to the credit card or other billing mechanism associated with Your AdWords account.

## 3. Member Account, Password, and Security.

To register for the Service, You must be acting in the course of business, complete the registration process by providing Google with current, complete and accurate information as prompted by the registration form, including Your e-mail address (username) and password. You will protect Your passwords and take full responsibility for Your own, and third party, use of Your accounts. You are solely responsible for any and all activities that occur under Your Account. You will notify Google immediately upon learning of any unauthorized use of Your Account or any other breach of security. Google or its Affiliates' support staff may, from time to time, log in to the Service under Your Account in order to maintain or improve service, including to provide You assistance with technical or billing issues. By creating Your Account you agree to receive electronic statements from Google and its Affiliates.

## 4. Nonexclusive License.

Subject to the terms and conditions of this Agreement, (a) Google grants You a limited, revocable, non-exclusive, non-sublicensable license to install, copy and use the SDK solely as necessary for You to use the Service on Your Apps or Third Parties Apps; and (b) You may remotely access, view and download Your Reports. You will not (and You will not allow any third party to) use data labeled as belonging to a third party in the Service for purposes other than generating, viewing, and downloading Reports. You will comply with all applicable laws and regulations and Your agreements with third parties in Your use of and access to the Documentation, Software, Service and Reports.

## 5. Confidentiality.

Neither party will use or disclose the other party's Confidential Information without the other's prior written consent except for the purpose of performing its obligations under this Agreement or if required by law, regulation or court order; in which case, the party being compelled to disclose Confidential Information will give the other party as much notice as is reasonably practicable prior to disclosing the Confidential Information if permitted by law.

## 6. Information Rights and Publicity.

Google and its Affiliates may retain and use, subject to the terms of its privacy policy (located at www.google.com/privacy.html), information collected in Your use of the Service. Google will not share Your Customer Data or any Third Party's Customer Data with any third parties unless Google (i) has Your consent for any Customer Data or any Third Party's consent for the Third Party's Customer Data; (ii) concludes that it is required by law or has a good faith belief that access, preservation or disclosure of Customer Data is reasonably necessary to protect the rights, property or safety of Google, its users or the public; or (iii) provides Customer Data in certain limited circumstances to third parties to carry out tasks on Google's behalf (e.g., billing or data storage) with strict restrictions that prevent the data from being used or shared except as directed by Google. When this is done, it is subject to agreements that oblige those parties to process Customer Data only on Google's instructions and in compliance with this Agreement and appropriate confidentiality and security measures.

## 7. Privacy.

You will not, and will not assist or permit any third party to, pass information to Google that Google could use or recognize as personally identifiable information. You will have and abide by an appropriate Privacy Policy and will comply with all applicable laws, policies, and regulations relating to the collection, usage and sharing of information from Users. You must post a Privacy Policy and that Privacy Policy must provide notice of Your use of cookies, identifiers for mobile devices (e.g., Android Advertising Identifier or Advertising Identifier for iOS) or similar technology that are used to collect data. You must disclose the use of the Service, and how it collects and processes data. This can be done by displaying a prominent link to the site "How Google uses data when you use our partners' sites or apps", (located at www.google.com/policies/privacy/partners/, or any other URL Google may provide from time to time). You will use commercially reasonable efforts to ensure that a User is provided with clear and comprehensive information about, and consents to, the storing and accessing of

cookies or other information on the User's device where such activity occurs in connection with the Service and where providing such information and obtaining such consent is required by law.

You must not circumvent any privacy features that are part of the Service.

Your access to and use of any other DoubleClick or Google service is subject to the applicable terms between You and Google regarding that service.

## 8. Indemnification.

To the maximum extent permitted by applicable law, You will indemnify, hold harmless and defend Google and its Affiliates, at Your expense, from any and all third-party claims, actions, proceedings, and suits brought against Google or any of its officers, directors, employees, agents or Affiliates, and all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, reasonable attorneys' fees and other litigation expenses) incurred by Google or any of its officers, directors, employees, agents or Affiliates, arising out of or relating to (i) Your breach of any term or condition of this Agreement, (ii) Your use of the Service, (iii) Your violations of applicable laws, rules or regulations in connection with the Service, (iv) any representations and warranties made by You concerning any aspect of the Service, the Software or Reports to any Third Party; (v) any claims made by or on behalf of any Third Party pertaining directly or indirectly to Your use of the Service, the Software or Reports; (vi) violations of Your obligations of privacy to any Third Party; and (vii) any claims with respect to acts or omissions of any Third Party in connection with the Service, the Software or Reports. Google will provide You with written notice of any claim, suit or action from which You must indemnify Google and its Affiliates. You will cooperate as fully as reasonably required in the defense of any claim. Google and its Affiliates reserve the right, at their own expense, to assume the exclusive defense and control of any matter subject to indemnification by You.

## 9. Third Parties.

If You use the Service on behalf of a Third Party or a Third Party otherwise uses the Service through Your Account, whether or not You are authorized by Google to do so, then You represent and warrant that (a) You are authorized to act on behalf of, and bind to this Agreement, the Third Party to all obligations that You have under this Agreement, (b) Google and its Affiliates may share with the Third Party any Customer Data that is specific to the Third Party's Apps, and (c) You will not disclose Third Party's Customer Data to any other party without the Third Party's consent.

## 10. DISCLAIMER OF WARRANTIES.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT AS EXPRESSLY PROVIDED FOR IN THIS AGREEMENT, GOOGLE MAKES NO OTHER WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR USE AND NON-INFRINGEMENT. THE SERVICE IS PROVIDED "AS IS".

## 11. LIMITATION OF LIABILITY.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, GOOGLE WILL NOT BE LIABLE FOR YOUR LOST PROFITS (WHETHER DIRECT OR INDIRECT) OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE LOSSES OR DAMAGES (WHETHER OR NOT FORESEEABLE OR CONTEMPLATED BY THE PARTIES), EVEN IF GOOGLE OR ITS AFFILIATES HAVE BEEN ADVISED OF, KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY. GOOGLE AND ITS AFFILIATES' TOTAL CUMULATIVE LIABILITY TO YOU OR ANY OTHER PARTY FOR ANY LOSS OR DAMAGES RESULTING FROM CLAIMS, DEMANDS, OR ACTIONS ARISING OUT OF OR RELATING TO THIS AGREEMENT WILL NOT EXCEED $500 (USD).

## 12. Proprietary Rights Notice.

The Service, which includes the Software and all intellectual property rights therein are, and will remain, the property of Google and its Affiliates. All rights in and to the Software not expressly granted to You in this Agreement are reserved and retained by Google, its Affiliates, and its licensors without restriction, including, Google's (and its Affiliates') right to sole ownership of the Software and Documentation. Without limiting the generality of the foregoing, You agree, to the maximum extent permitted by applicable law, not to (and not to allow any third party to): (a) sublicense, distribute, or use the Service or Software outside of the scope of the license granted in this Agreement; (b) copy, modify, adapt, translate, prepare derivative works from, reverse engineer, disassemble, or decompile the Software or Documentation or otherwise attempt to discover any source code or trade secrets related to the Service; (c) rent, lease, sell, assign or otherwise transfer rights in or to the Software, the Documentation or the Service; (d) use, post, transmit or introduce any device, software or routine which interferes or attempts to interfere with the operation of the Service or the Software; (e) use the trademarks, trade names, service marks, logos, domain names and other distinctive brand features or any copyright or other proprietary rights associated with the Service for any purpose without the

express written consent of Google and its Affiliates ; (f) register, attempt to register, or assist anyone else to register any trademark, trade name, serve marks, logos, domain names and other distinctive brand features, copyright or other proprietary rights associated with Google or its Affiliates other than in the name of Google (or its Affiliates as the case may be); (g) remove, obscure, or alter any notice of copyright, trademark, or other proprietary right appearing in or on any item included with the Service or Software or (h) seek, in a proceeding filed during the term of this Agreement or for one year after such term, an injunction of any portion of the Service based on patent infringement.

## 13. U.S. Government Rights.

If the use of the Service is being acquired by or on behalf of the U.S. Government or by a U.S. Government prime contractor or subcontractor (at any tier), in accordance with 48 C.F.R. 227.7202-4 (for Department of Defense (DOD) acquisitions) and 48 C.F.R. 2.101 and 12.212 (for non-DOD acquisitions), the Government's rights in the Software, including its rights to use, modify, reproduce, release, perform, display or disclose the Software or Documentation, will be subject in all respects to the commercial license rights and restrictions provided in this Agreement.

## 14. Term and Termination.

Either party may terminate this Agreement at any time with notice. Upon any termination of this Agreement, Google will stop providing, and You will stop using the Service. In the event of any termination (a) You will not be entitled to any refunds of any usage fees or any other fees, and (b) any outstanding balance for Service rendered through the date of termination will be immediately due and payable in full and (c) all of Your historical Report data will no longer be available to You.

## 15. Modifications to Terms of Service and Other Policies.

Google may modify these terms or any additional terms that apply to the Service to, for example, reflect changes to the law or changes to the Service. You should look at the terms regularly. Google will post notice of modifications to these terms at firebase.google.com/terms/analytics (//web.archive.org/web/20200813203704/https://firebase.google.com/terms/analytics),the Google Analytics for Firebase Policies at firebase.google.com/policies/analytics (//web.archive.org/web/20200813203704/https://firebase.google.com/policies/analytics), or other

policies referenced in these terms at the applicable URL for such policies. Changes will not apply retroactively and will become effective no sooner than 14 days after they are posted. If You do not agree to the modified terms for the Service, You should discontinue Your use of the Service. No amendment to or modification of this Agreement will be binding unless (i) in writing and signed by a duly authorized representative of Google, (ii) You accept updated terms online, or (iii) You continue to use the Service after Google has posted updates to the Agreement or to any policy governing the Service.

## 16. Applicable Law and Venue.

(a) Except as set forth in Sections 16(b) and (c) below, all claims arising out of or relating to this Agreement or the Services ("Disputes") will be governed by California law, excluding California's conflict of laws rules, and all Disputes will be litigated exclusively in the federal or state courts of Santa Clara County, California, USA, and You and Google consent to personal jurisdiction in those courts.

(b) If Your principal place of business (for entities) or place of residence (for individuals) is in any country within APAC (other than Australia, Japan, New Zealand or Singapore) or Latin America, this Section 16(b) will apply instead of Section 16(a) above. ALL DISPUTES (AS DEFINED ABOVE) WILL BE GOVERNED BY CALIFORNIA LAW, EXCLUDING CALIFORNIA'S CONFLICT OF LAWS RULES. The parties will try in good faith to settle any Dispute within 30 days after the Dispute arises. If the Dispute is not resolved within 30 days, it must be resolved by arbitration by the American Arbitration Association's International Centre for Dispute Resolution in accordance with its Expedited Commercial Rules in force as of the date of this Agreement ("Rules"). The parties will mutually select one arbitrator. The arbitration will be conducted in English in Santa Clara County, California, USA. Either party may apply to any competent court for injunctive relief necessary to protect its rights pending resolution of the arbitration. The arbitrator may order equitable or injunctive relief consistent with the remedies and limitations in this Agreement. Subject to the confidentiality requirements in Section 5, either party may petition any competent court to issue any order necessary to protect that party's rights or property; this petition will not be considered a violation or waiver of this governing law and arbitration section and will not affect the arbitrator's powers, including the power to review the judicial decision. The parties stipulate that the courts of Santa Clara County, California, USA, are competent to grant any order under this subsection. The arbitral award will be final and binding on the parties and its execution may be presented in any competent court, including any court with jurisdiction over either party or any of its property. Any arbitration proceeding conducted in accordance with this section will be considered Confidential Information under this Agreement's confidentiality section, including (i) the

existence of, (ii) any information disclosed during, and (iii) any oral communications or documents related to the arbitration proceedings. The parties may also disclose the information described in this section to a competent court as may be necessary to file any order under this section or execute any arbitral decision, but the parties must request that those judicial proceedings be conducted in camera (in private). The parties will pay the arbitrator's fees, the arbitrator's appointed experts' fees and expenses, and the arbitration center's administrative expenses in accordance with the Rules. In its final decision, the arbitrator will determine the non-prevailing party's obligation to reimburse the amount paid in advance by the prevailing party for these fees. Each party will bear its own lawyers' and experts' fees and expenses, regardless of the arbitrator's final decision.

(c) If Your principal place of business (for entities) or place of residence (for individuals) is in Greece, all Disputes (as defined above) will be governed by Greek law and the parties submit to the exclusive jurisdiction of the courts of Athens in relation to any Dispute.

## 17. Miscellaneous

Google and its Affiliates will be excused from performance in this Agreement to the extent that performance is prevented, delayed or obstructed by causes beyond its reasonable control. This Agreement (including any amendment agreed upon by the parties in writing) represents the complete agreement between You and Google concerning its subject matter, and supersedes all prior agreements and representations between the parties. If any provision of this Agreement is held to be unenforceable for any reason, such provision will be reformed to the extent necessary to make it enforceable to the maximum extent permissible so as to effect the intent of the parties, and the remainder of this Agreement will continue in full force and effect. Certain laws of the jurisdiction in which you reside may confer rights and remedies and imply terms into this Agreement that cannot be excluded. Those rights, remedies, and implied terms are not excluded by this Agreement. To the extent that the relevant laws permit Google to limit their operation, Google's liability under those laws will be limited at its option, to the supply of the services again, or payment of the cost of having the services supplied again. The United Nations Convention on Contracts for the International Sale of Goods and the Uniform Computer Information Transactions Act do not apply to this Agreement. The Software is controlled by U.S. Export Regulations, and it may be not be exported to or used by embargoed countries or individuals. Any notices to Google must be sent to: Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA, with a copy to Legal Department, via first class or air mail or overnight courier, and are deemed given upon receipt. A waiver of any default is not a waiver of any subsequent default. You may not assign or otherwise transfer any of Your rights in this Agreement without Google's prior written consent, and any such

attempt is void. Google may assign or otherwise transfer this Agreement to any of its Affiliates. The relationship between Google and You is not one of a legal partnership relationship, but is one of independent contractors. This Agreement will be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. The following sections of this Agreement will survive any termination thereof: 1, 4, 5, 6 , 7, 8, 9, 10, 11, 12, 14, 16 and 17.

## Previous versions

- May 17, 2017 (/web/20200813203704/https://firebase.google.com/terms/analytics/20170517)

- May 18, 2016 (/web/20200813203704/https://firebase.google.com/terms/analytics/20160518)

**Google Analytics for Firebase Terms of Service, last updated April 17, 2019, downloaded on March 28, 2024, available at: https://web.archive.org/ web/20230405151442/https:// firebase.google.com/terms/ analytics/**

The Wayback Machine - https://web.archive.org/web/20190910123710/https://firebase.goog...

# GOOGLE ANALYTICS FOR FIREBASE TERMS OF SERVICE

**Terms last modified: April 17, 2019** | Previous versions (#previous_versions)

These Google Analytics for Firebase Terms of Service are entered into by the entity or individual using the Service (**"You"**) and:

(A) if Your address is in any country within Europe, the Middle East, or Africa: Google Ireland Limited ("**Google**"), with offices at Gordon House, Barrow Street, Dublin 4, Ireland;

(B) if Your address is in a country within the Asia Pacific region: Google Asia Pacific Pte. Ltd. ("**GAP**"), of 70 Pasir Panjang Road, #03-71, Mapletree Business City II, Singapore 117371, unless Your address is in one of the following countries, in which case the specified entity as a reseller:

- Australia: Google Australia Pty Ltd of Level 5, 48 Pirrama Road, Pyrmont 2009, NSW, Australia

- New Zealand: Google New Zealand Limited of PWC Tower, Level 27, 188 Quay Street, Auckland, New Zealand 1010

- Japan: Google Japan G.K. of Roppongi Hills Mori Tower, 6-10-1, Roppongi, Minato-ku, Tokyo, Japan

("**Google Reseller**") and references to "**Google**" mean Google LLC, GAP, Google Reseller, and/or their affiliates, depending on the context; or

(C) if Your address is anywhere else in the world: Google LLC ("**Google**"), with offices at 1600 Amphitheatre Parkway, Mountain View, California 94043.

This Agreement (as defined below) governs Your use of Google Analytics for Firebase (the **"Service"**). BY CLICKING THE "I ACCEPT" BUTTON, COMPLETING THE REGISTRATION PROCESS, OR USING THE SERVICE, YOU ACKNOWLEDGE THAT YOU HAVE REVIEWED AND ACCEPT THIS AGREEMENT AND ARE AUTHORIZED TO ACT ON BEHALF OF, AND BIND TO THIS AGREEMENT, THE OWNER OF THIS

ACCOUNT. You confirm that you will comply with the Google Analytics for Firebase Policies
 (https://web.archive.org/web/20190910123710/https://firebase.google.com/policies/analytics)
and that you have separately entered the Google API Terms of Service
 (https://web.archive.org/web/20190910123710/https://developers.google.com/terms/) with
Google LLC (which, along with the Google Analytics for Firebase Terms of Service
and the Google Analytics for Firebase Policies
 (https://web.archive.org/web/20190910123710/https://firebase.google.com/policies/analytics/)
, mean the "**Agreement**"). The parties agree as follows:

## 1. Definitions.

"**Account**" refers to the account for the Service.

"**Affiliate(s)**" means in relation to each of the parties: (a) any parent company of
that party; and (b) any corporate body of which that party directly or indirectly has
control or which is directly or indirectly controlled by the same person or group of
persons as that party.

"**Confidential Information**" includes any proprietary data and any other information
disclosed by one party to the other in writing and marked "confidential" or disclosed
orally and, within five business days, reduced to writing and marked "confidential".
However, Confidential Information will not include any information that is or
becomes known to the general public, which is already in the receiving party's
possession prior to disclosure by a party or which is independently developed by
the receiving party without the use of Confidential Information.

"**Customer Data**" means the data You collect, process or store using the Service
concerning the characteristics and activities of Users.

"**Documentation**" means any accompanying documentation made available to You
by Google for use with the Processing Software, including any documentation
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in an App for the purpose of collecting Customer Data, together with any fixes,
updates and upgrades provided to You.

**"Processing Software"** means the Google server-side software and any upgrades, which analyzes the Customer Data and generates the Reports.

**"App"** means any app or other resource that sends data to the Service. Each App must be under Your control.

**"Privacy Policy"** means the privacy policy on an App.

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**"Users"** means users of Your Apps.

The words **"include"** and **"including"** mean "including but not limited to."

## 2. Fees and Service.

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## 3. Member Account, Password, and Security.

To register for the Service, You must be acting in the course of business, complete the registration process by providing Google with current, complete and accurate information as prompted by the registration form, including Your e-mail address (username) and password. You will protect Your passwords and take full

responsibility for Your own, and third party, use of Your accounts. You are solely responsibility for any and all activities that occur under Your Account. You will notify Google immediately upon learning of any unauthorized use of Your Account or any other breach of security. Google or its Affiliates' support staff may, from time to time, log in to the Service under Your Account in order to maintain or improve service, including to provide You assistance with technical or billing issues. By creating Your Account you agree to receive electronic statements from Google and its Affiliates.

## 4. Nonexclusive License.

Subject to the terms and conditions of this Agreement, (a) Google grants You a limited, revocable, non-exclusive, non-sublicensable license to install, copy and use the SDK solely as necessary for You to use the Service on Your Apps or Third Parties Apps; and (b) You may remotely access, view and download Your Reports. You will not (and You will not allow any third party to) use data labeled as belonging to a third party in the Service for purposes other than generating, viewing, and downloading Reports. You will comply with all applicable laws and regulations and Your agreements with third parties in Your use of and access to the Documentation, Software, Service and Reports.

## 5. Confidentiality.

Neither party will use or disclose the other party's Confidential Information without the other's prior written consent except for the purpose of performing its obligations under this Agreement or if required by law, regulation or court order; in which case, the party being compelled to disclose Confidential Information will give the other party as much notice as is reasonably practicable prior to disclosing the Confidential Information if permitted by law.

## 6. Information Rights and Publicity.

Google and its Affiliates may retain and use, subject to the terms of its privacy policy (located at www.google.com/privacy.html), information collected in Your use of the Service. Google will not share Your Customer Data or any Third Party's Customer Data with any third parties unless Google (i) has Your consent for any Customer Data or any Third Party's consent for the Third Party's Customer Data; (ii)

concludes that it is required by law or has a good faith belief that access, preservation or disclosure of Customer Data is reasonably necessary to protect the rights, property or safety of Google, its users or the public; or (iii) provides Customer Data in certain limited circumstances to third parties to carry out tasks on Google's behalf (e.g., billing or data storage) with strict restrictions that prevent the data from being used or shared except as directed by Google. When this is done, it is subject to agreements that oblige those parties to process Customer Data only on Google's instructions and in compliance with this Agreement and appropriate confidentiality and security measures.

## 7. Privacy.

You will not, and will not assist or permit any third party to, pass information to Google that Google could use or recognize as personally identifiable information. You will have and abide by an appropriate Privacy Policy and will comply with all applicable laws, policies, and regulations relating to the collection, usage and sharing of information from Users. You must post a Privacy Policy and that Privacy Policy must provide notice of Your use of cookies, identifiers for mobile devices (e.g., Android Advertising Identifier or Advertising Identifier for iOS) or similar technology that are used to collect data. You must disclose the use of the Service, and how it collects and processes data. This can be done by displaying a prominent link to the site "How Google uses data when you use our partners' sites or apps", (located at www.google.com/policies/privacy/partners/, or any other URL Google may provide from time to time). You will use commercially reasonable efforts to ensure that a User is provided with clear and comprehensive information about, and consents to, the storing and accessing of cookies or other information on the User's device where such activity occurs in connection with the Service and where providing such information and obtaining such consent is required by law.

You must not circumvent any privacy features that are part of the Service.

Your access to and use of any other DoubleClick or Google service is subject to the applicable terms between You and Google regarding that service.

## 8. Indemnification.

To the maximum extent permitted by applicable law, You will indemnify, hold harmless and defend Google and its Affiliates, at Your expense, from any and all

third-party claims, actions, proceedings, and suits brought against Google or any of its officers, directors, employees, agents or Affiliates, and all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, reasonable attorneys' fees and other litigation expenses) incurred by Google or any of its officers, directors, employees, agents or Affiliates, arising out of or relating to (i) Your breach of any term or condition of this Agreement, (ii) Your use of the Service, (iii) Your violations of applicable laws, rules or regulations in connection with the Service, (iv) any representations and warranties made by You concerning any aspect of the Service, the Software or Reports to any Third Party; (v) any claims made by or on behalf of any Third Party pertaining directly or indirectly to Your use of the Service, the Software or Reports; (vi) violations of Your obligations of privacy to any Third Party; and (vii) any claims with respect to acts or omissions of any Third Party in connection with the Service, the Software or Reports. Google will provide You with written notice of any claim, suit or action from which You must indemnify Google and its Affiliates. You will cooperate as fully as reasonably required in the defense of any claim. Google and its Affiliates reserve the right, at their own expense, to assume the exclusive defense and control of any matter subject to indemnification by You.

## 9. Third Parties.

If You use the Service on behalf of a Third Party or a Third Party otherwise uses the Service through Your Account, whether or not You are authorized by Google to do so, then You represent and warrant that (a) You are authorized to act on behalf of, and bind to this Agreement, the Third Party to all obligations that You have under this Agreement, (b) Google and its Affiliates may share with the Third Party any Customer Data that is specific to the Third Party's Apps, and (c) You will not disclose Third Party's Customer Data to any other party without the Third Party's consent.

## 10. DISCLAIMER OF WARRANTIES.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT AS EXPRESSLY PROVIDED FOR IN THIS AGREEMENT, GOOGLE MAKES NO OTHER WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION WARRANTIES OF

MERCHANTABILITY, FITNESS FOR A PARTICULAR USE AND NON-INFRINGEMENT. THE SERVICE IS PROVIDED "AS IS".

## 11. LIMITATION OF LIABILITY.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, GOOGLE WILL NOT BE LIABLE FOR YOUR LOST PROFITS (WHETHER DIRECT OR INDIRECT) OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE LOSSES OR DAMAGES (WHETHER OR NOT FORESEEABLE OR CONTEMPLATED BY THE PARTIES), EVEN IF GOOGLE OR ITS AFFILIATES HAVE BEEN ADVISED OF, KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY. GOOGLE AND ITS AFFILIATES' TOTAL CUMULATIVE LIABILITY TO YOU OR ANY OTHER PARTY FOR ANY LOSS OR DAMAGES RESULTING FROM CLAIMS, DEMANDS, OR ACTIONS ARISING OUT OF OR RELATING TO THIS AGREEMENT WILL NOT EXCEED $500 (USD).

## 12. Proprietary Rights Notice.

The Service, which includes the Software and all intellectual property rights therein are, and will remain, the property of Google and its Affiliates. All rights in and to the Software not expressly granted to You in this Agreement are reserved and retained by Google, its Affiliates, and its licensors without restriction, including, Google's (and its Affiliates') right to sole ownership of the Software and Documentation. Without limiting the generality of the foregoing, You agree, to the maximum extent permitted by applicable law, not to (and not to allow any third party to): (a) sublicense, distribute, or use the Service or Software outside of the scope of the license granted in this Agreement; (b) copy, modify, adapt, translate, prepare derivative works from, reverse engineer, disassemble, or decompile the Software or Documentation or otherwise attempt to discover any source code or trade secrets related to the Service; (c) rent, lease, sell, assign or otherwise transfer rights in or to the Software, the Documentation or the Service; (d) use, post, transmit or introduce any device, software or routine which interferes or attempts to interfere with the operation of the Service or the Software; (e) use the trademarks, trade names, service marks, logos, domain names and other distinctive brand features or any copyright or other proprietary rights associated with the Service for any purpose without the express written consent of Google and its Affiliates ; (f) register,

attempt to register, or assist anyone else to register any trademark, trade name, serve marks, logos, domain names and other distinctive brand features, copyright or other proprietary rights associated with Google or its Affiliates other than in the name of Google (or its Affiliates as the case may be); (g) remove, obscure, or alter any notice of copyright, trademark, or other proprietary right appearing in or on any item included with the Service or Software or (h) seek, in a proceeding filed during the term of this Agreement or for one year after such term, an injunction of any portion of the Service based on patent infringement.

## 13. U.S. Government Rights.

If the use of the Service is being acquired by or on behalf of the U.S. Government or by a U.S. Government prime contractor or subcontractor (at any tier), in accordance with 48 C.F.R. 227.7202-4 (for Department of Defense (DOD) acquisitions) and 48 C.F.R. 2.101 and 12.212 (for non-DOD acquisitions), the Government's rights in the Software, including its rights to use, modify, reproduce, release, perform, display or disclose the Software or Documentation, will be subject in all respects to the commercial license rights and restrictions provided in this Agreement.

## 14. Term and Termination.

Either party may terminate this Agreement at any time with notice. Upon any termination of this Agreement, Google will stop providing, and You will stop using the Service. In the event of any termination (a) You will not be entitled to any refunds of any usage fees or any other fees, and (b) any outstanding balance for Service rendered through the date of termination will be immediately due and payable in full and (c) all of Your historical Report data will no longer be available to You.

## 15. Modifications to Terms of Service and Other Policies.

Google may modify these terms or any additional terms that apply to the Service to, for example, reflect changes to the law or changes to the Service. You should look at the terms regularly. Google will post notice of modifications to these terms at firebase.google.com/terms/analytics
 (//web.archive.org/web/20190910123710/https://firebase.google.com/terms/analytics),the Google Analytics for Firebase Policies at firebase.google.com/policies/analytics

(//web.archive.org/web/20190910123710/https://firebase.google.com/policies/analytics), or other policies referenced in these terms at the applicable URL for such policies. Changes will not apply retroactively and will become effective no sooner than 14 days after they are posted. If You do not agree to the modified terms for the Service, You should discontinue Your use of the Service. No amendment to or modification of this Agreement will be binding unless (i) in writing and signed by a duly authorized representative of Google, (ii) You accept updated terms online, or (iii) You continue to use the Service after Google has posted updates to the Agreement or to any policy governing the Service.

## 16. Applicable Law and Venue.

(a) Except as set forth in Sections 16(b) and (c) below, all claims arising out of or relating to this Agreement or the Services ("Disputes") will be governed by California law, excluding California's conflict of laws rules, and all Disputes will be litigated exclusively in the federal or state courts of Santa Clara County, California, USA, and You and Google consent to personal jurisdiction in those courts.

(b) If Your principal place of business (for entities) or place of residence (for individuals) is in any country within APAC (other than Australia, Japan, New Zealand or Singapore) or Latin America, this Section 16(b) will apply instead of Section 16(a) above. ALL DISPUTES (AS DEFINED ABOVE) WILL BE GOVERNED BY CALIFORNIA LAW, EXCLUDING CALIFORNIA'S CONFLICT OF LAWS RULES. The parties will try in good faith to settle any Dispute within 30 days after the Dispute arises. If the Dispute is not resolved within 30 days, it must be resolved by arbitration by the American Arbitration Association's International Centre for Dispute Resolution in accordance with its Expedited Commercial Rules in force as of the date of this Agreement ("Rules"). The parties will mutually select one arbitrator. The arbitration will be conducted in English in Santa Clara County, California, USA. Either party may apply to any competent court for injunctive relief necessary to protect its rights pending resolution of the arbitration. The arbitrator may order equitable or injunctive relief consistent with the remedies and limitations in this Agreement. Subject to the confidentiality requirements in Section 5, either party may petition any competent court to issue any order necessary to protect that party's rights or property; this petition will not be considered a violation or waiver of this governing law and arbitration section and will not affect the arbitrator's powers, including the power to review the judicial decision. The parties stipulate that the courts of Santa Clara County, California, USA, are competent to grant any order

under this subsection. The arbitral award will be final and binding on the parties and its execution may be presented in any competent court, including any court with jurisdiction over either party or any of its property. Any arbitration proceeding conducted in accordance with this section will be considered Confidential Information under this Agreement's confidentiality section, including (i) the existence of, (ii) any information disclosed during, and (iii) any oral communications or documents related to the arbitration proceedings. The parties may also disclose the information described in this section to a competent court as may be necessary to file any order under this section or execute any arbitral decision, but the parties must request that those judicial proceedings be conducted in camera (in private). The parties will pay the arbitrator's fees, the arbitrator's appointed experts' fees and expenses, and the arbitration center's administrative expenses in accordance with the Rules. In its final decision, the arbitrator will determine the non-prevailing party's obligation to reimburse the amount paid in advance by the prevailing party for these fees. Each party will bear its own lawyers' and experts' fees and expenses, regardless of the arbitrator's final decision.

(c) If Your principal place of business (for entities) or place of residence (for individuals) is in Greece, all Disputes (as defined above) will be governed by Greek law and the parties submit to the exclusive jurisdiction of the courts of Athens in relation to any Dispute.

## 17. Miscellaneous

Google and its Affiliates will be excused from performance in this Agreement to the extent that performance is prevented, delayed or obstructed by causes beyond its reasonable control. This Agreement (including any amendment agreed upon by the parties in writing) represents the complete agreement between You and Google concerning its subject matter, and supersedes all prior agreements and representations between the parties. If any provision of this Agreement is held to be unenforceable for any reason, such provision will be reformed to the extent necessary to make it enforceable to the maximum extent permissible so as to effect the intent of the parties, and the remainder of this Agreement will continue in full force and effect. Certain laws of the jurisdiction in which you reside may confer rights and remedies and imply terms into this Agreement that cannot be excluded. Those rights, remedies, and implied terms are not excluded by this Agreement. To the extent that the relevant laws permit Google to limit their operation, Google's liability under those laws will be limited at its option, to the supply of the services

again, or payment of the cost of having the services supplied again. The United Nations Convention on Contracts for the International Sale of Goods and the Uniform Computer Information Transactions Act do not apply to this Agreement. The Software is controlled by U.S. Export Regulations, and it may be not be exported to or used by embargoed countries or individuals. Any notices to Google must be sent to: Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA, with a copy to Legal Department, via first class or air mail or overnight courier, and are deemed given upon receipt. A waiver of any default is not a waiver of any subsequent default. You may not assign or otherwise transfer any of Your rights in this Agreement without Google's prior written consent, and any such attempt is void. Google may assign or otherwise transfer this Agreement to any of its Affiliates. The relationship between Google and You is not one of a legal partnership relationship, but is one of independent contractors. This Agreement will be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. The following sections of this Agreement will survive any termination thereof: 1, 4, 5, 6 , 7, 8, 9, 10, 11, 12, 14, 16 and 17.

### Previous versions

- Oct 1, 2018
  (/web/20190910123710/https://firebase.google.com/terms/analytics/20181001)

- May 17, 2017
  (/web/20190910123710/https://firebase.google.com/terms/analytics/20170517)

- May 18, 2016
  (/web/20190910123710/https://firebase.google.com/terms/analytics/20160518)

**Google Analytics Terms of Service, last updated June 17, 2019, downloaded on March 28, 2024, available at https://web.archive.org/web/20231225155302/https://marketingplatform.google.com/about/analytics/terms/gb-20190617/**

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Please note that these terms have been modified.

# Google Analytics Terms of Service

These Google Analytics Terms of Service (this **"Agreement"**) are entered into by Google LLC (**"Google"**) and the entity executing this Agreement (**"You"**). This Agreement governs Your use of the standard Google Analytics (the **"Service"**). BY CLICKING THE "I ACCEPT" BUTTON, COMPLETING THE REGISTRATION PROCESS, OR USING THE SERVICE, YOU ACKNOWLEDGE THAT YOU HAVE REVIEWED AND ACCEPT THIS AGREEMENT AND ARE AUTHORIZED TO ACT ON BEHALF OF, AND BIND TO THIS AGREEMENT, THE OWNER OF THIS ACCOUNT. In consideration of the foregoing, the parties agree as follows:

## 1. Definitions.

*"Account"* refers to the account for the Service. All Profiles (as applicable) linked to a single Property will have their Hits aggregated before determining the charge for the Service for that Property.

*"Confidential Information"* includes any proprietary data and any other information disclosed by one party to the other in writing and marked "confidential" or disclosed orally and, within five business days, reduced to writing and marked "confidential". However, Confidential Information will not include any information that is or becomes known to the general public, which is already in the receiving party's possession prior to disclosure by a party or which is independently developed by the receiving party without the use of Confidential Information.

*"Customer Data"* or "Google Analytics Data" means the data you collect, process or store using the Service concerning the characteristics and activities of Users.

*"Documentation"* means any accompanying documentation made available to You by Google for use with the Processing Software, including any documentation available online.

*"GAMC"* means the Google Analytics Measurement Code, which is installed on a

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be a call to the Service by various libraries, but does not have to be so (e.g., a Hit can be delivered to the Service by other Google Analytics-supported protocols and mechanisms made available by the Service to You).

*"Platform Home"* means the user interface through which You can access certain Google Marketing Platform-level functionality.

*"Processing Software"* means the Google Analytics server-side software and any upgrades, which analyzes the Customer Data and generates the Reports.

*"Profile"* means the collection of settings that together determine the information to be included in, or excluded from, a particular Report. For example, a Profile could be established to view a small portion of a web site as a unique Report.

*"Property"* means any web page, application, other property or resource under Your control that sends data to Google Analytics.

*"Privacy Policy"* means the privacy policy on a Property.

*"Report"* means the resulting analysis shown at [www.google.com/analytics/](www.google.com/analytics/), some of which may include analysis for a Profile.

*"Servers"* means the servers controlled by Google (or its wholly-owned subsidiaries) on which the Processing Software and Customer Data are stored.

*"SDKs"* mean certain software development kits, which may be used or incorporated into a Property app for the purpose of collecting Customer Data, together with any fixes, updates, and upgrades provided to You.

*"Software"* means the Processing Software, GAMC and/or SDKs.

*"Third Party"* means any third party (i) to which You provide access to Your Account or (ii) for which You use the Service to collect information on the third party's behalf.

*"Users"* means users and/or visitors to Your Properties.

The words *"include"* and *"including"* mean "including but not limited to."

## 2. Fees and Service.

Subject to Section 15, the Service is provided without charge to You for up to 10 million

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of those changes which will be posted at www.google.com/analytics/. Unless otherwise stated, all fees are quoted in U.S. Dollars. Any outstanding balance becomes immediately due and payable upon termination of this Agreement and any collection expenses (including attorneys' fees) incurred by Google will be included in the amount owed, and may be charged to the credit card or other billing mechanism associated with Your AdWords account.

## 3. Member Account, Password, and Security.

To register for the Service, You must complete the registration process by providing Google with current, complete and accurate information as prompted by the registration form, including Your e-mail address (username) and password. You will protect Your passwords and take full responsibility for Your own, and third party, use of Your accounts. You are solely responsible for any and all activities that occur under Your Account. You will notify Google immediately upon learning of any unauthorized use of Your Account or any other breach of security. Google's (or its wholly-owned subsidiaries) support staff may, from time to time, log in to the Service under Your customer password in order to maintain or improve service, including to provide You assistance with technical or billing issues.

## 4. Nonexclusive License.

Subject to the terms and conditions of this Agreement, (a) Google grants You a limited, revocable, non-exclusive, non-sublicensable license to install, copy and use the GAMC and/or SDKs solely as necessary for You to use the Service on Your Properties or Third Party's Properties; and (b) You may remotely access, view and download Your Reports stored at www.google.com/analytics/. You will not (and You will not allow any third party to) (i) copy, modify, adapt, translate or otherwise create derivative works of the Software or the Documentation; (ii) reverse engineer, decompile, disassemble or otherwise attempt to discover the source code of the Software, except as expressly permitted by the law in effect in the jurisdiction in which You are located; (iii) rent, lease, sell, assign or otherwise transfer rights in or to the Software, the Documentation or the Service; (iv) remove any proprietary notices or labels on the Software or placed by the Service; (v) use, post, transmit or introduce any device, software or routine which interferes or attempts to interfere with the operation of the Service or the Software; or (vi) use data

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## 5. Confidentiality and Beta Features.

Neither party will use or disclose the other party's Confidential Information without the other's prior written consent except for the purpose of performing its obligations under this Agreement or if required by law, regulation or court order; in which case, the party being compelled to disclose Confidential Information will give the other party as much notice as is reasonably practicable prior to disclosing the Confidential Information. Certain Service features are identified as "Alpha," "Beta," "Experiment," (either within the Service or elsewhere by Google) or as otherwise unsupported or confidential (collectively, **"Beta Features"**). You may not disclose any information from Beta Features or the terms or existence of any non-public Beta Features. Google will have no liability arising out of or related to any Beta Features.

## 6. Information Rights and Publicity.

Google and its wholly owned subsidiaries may retain and use, subject to the terms of its privacy policy (located at https://www.google.com/policies/privacy/), information collected in Your use of the Service. Google will not share Your Customer Data or any Third Party's Customer Data with any third parties unless Google (i) has Your consent for any Customer Data or any Third Party's consent for the Third Party's Customer Data; (ii) concludes that it is required by law or has a good faith belief that access, preservation or disclosure of Customer Data is reasonably necessary to protect the rights, property or safety of Google, its users or the public; or (iii) provides Customer Data in certain limited circumstances to third parties to carry out tasks on Google's behalf (e.g., billing or data storage) with strict restrictions that prevent the data from being used or shared except as directed by Google. When this is done, it is subject to agreements that oblige those parties to process Customer Data only on Google's instructions and in compliance with this Agreement and appropriate confidentiality and security measures.

## 7. Privacy.

You will not and will not assist or permit any third party to, pass information to Google

Google serves cookies to analyse traffic to this site. Information about your use of our site is shared with Google for that purpose.    See details    OK, got it

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for iOS) or similar technology used to collect data. You must disclose the use of Google Analytics, and how it collects and processes data. This can be done by displaying a prominent link to the site "How Google uses data when you use our partners' sites or apps", (located at www.google.com/policies/privacy/partners/, or any other URL Google may provide from time to time). You will use commercially reasonable efforts to ensure that a User is provided with clear and comprehensive information about, and consents to, the storing and accessing of cookies or other information on the User's device where such activity occurs in connection with the Service and where providing such information and obtaining such consent is required by law.

You must not circumvent any privacy features (e.g., an opt-out) that are part of the Service. You will comply with all applicable Google Analytics policies located at www.google.com/analytics/policies/ (or such other URL as Google may provide) as modified from time to time (the **"Google Analytics Policies"**).

You may participate in an integrated version of Google Analytics and certain Google advertising services ("Google Analytics Advertising Features"). If You use Google Analytics Advertising Features, You will adhere to the Google Analytics Advertising Features policy (available at support.google.com/analytics/bin/answer.py?hl=en&topic=2611283&answer=2700409). Your access to and use of any Google advertising service is subject to the applicable terms between You and Google regarding that service.

If You use the Platform Home, Your use of the Platform Home is subject to the Platform Home Additional Terms (or as subsequently re-named) available at https://support.google.com/marketingplatform/answer/9047313 (or such other URL as Google may provide) as modified from time to time (the "Platform Home Terms").

## 8. Indemnification.

To the extent permitted by applicable law, You will indemnify, hold harmless and defend Google and its wholly-owned subsidiaries, at Your expense, from any and all third-party claims, actions, proceedings, and suits brought against Google or any of its officers, directors, employees, agents or affiliates, and all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, reasonable attorneys' fees and other litigation expenses) incurred by Google or any of its officers, directors, employees, agents or affiliates, arising out of or relating to (i) Your breach of any term or condition of this Agreement, (ii) Your use of the Service, (iii) Your violations of applicable

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Your obligations of privacy to any Third Party; and (vii) any claims with respect to acts or omissions of any Third Party in connection with the Service, the Software or Reports. Google will provide You with written notice of any claim, suit or action from which You must indemnify Google. You will cooperate as fully as reasonably required in the defense of any claim. Google reserves the right, at its own expense, to assume the exclusive defense and control of any matter subject to indemnification by You.

## 9. Third Parties.

If You use the Service on behalf of the Third Party or a Third Party otherwise uses the Service through Your Account, whether or not You are authorized by Google to do so, then You represent and warrant that (a) You are authorized to act on behalf of, and bind to this Agreement, the Third Party to all obligations that You have under this Agreement, (b) Google may share with the Third Party any Customer Data that is specific to the Third Party's Properties, and (c) You will not disclose Third Party's Customer Data to any other party without the Third Party's consent.

## 10. DISCLAIMER OF WARRANTIES.

TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT AS EXPRESSLY PROVIDED FOR IN THIS AGREEMENT, GOOGLE MAKES NO OTHER WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR USE AND NONINFRINGEMENT.

## 11. LIMITATION OF LIABILITY.

TO THE EXTENT PERMITTED BY APPLICABLE LAW, GOOGLE WILL NOT BE LIABLE FOR YOUR LOST REVENUES OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE DAMAGES, EVEN IF GOOGLE OR ITS SUBSIDIARIES AND AFFILIATES HAVE BEEN ADVISED OF, KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY. GOOGLE'S (AND ITS WHOLLY OWNED SUBSIDIARIES') TOTAL CUMULATIVE LIABILITY TO YOU OR ANY OTHER PARTY FOR ANY LOSS OR DAMAGES RESULTING

Google serves cookies to analyse traffic to this site. Information about your use of our site is shared with Google for that purpose.    See details    OK, got it

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The Service, which includes the Software and all Intellectual Property Rights therein are, and will remain, the property of Google (and its wholly owned subsidiaries). All rights in and to the Software not expressly granted to You in this Agreement are reserved and retained by Google and its licensors without restriction, including, Google's (and its wholly owned subsidiaries') right to sole ownership of the Software and Documentation. Without limiting the generality of the foregoing, You agree not to (and not to allow any third party to): (a) sublicense, distribute, or use the Service or Software outside of the scope of the license granted in this Agreement; (b) copy, modify, adapt, translate, prepare derivative works from, reverse engineer, disassemble, or decompile the Software or otherwise attempt to discover any source code or trade secrets related to the Service; (c) rent, lease, sell, assign or otherwise transfer rights in or to the Software, Documentation or the Service; (d) use, post, transmit or introduce any device, software or routine which interferes or attempts to interfere with the operation of the Service or the Software; (e) use the trademarks, trade names, service marks, logos, domain names and other distinctive brand features or any copyright or other proprietary rights associated with the Service for any purpose without the express written consent of Google; (f) register, attempt to register, or assist anyone else to register any trademark, trade name, serve marks, logos, domain names and other distinctive brand features, copyright or other proprietary rights associated with Google (or its wholly owned subsidiaries) other than in the name of Google (or its wholly owned subsidiaries, as the case may be); (g) remove, obscure, or alter any notice of copyright, trademark, or other proprietary right appearing in or on any item included with the Service or Software; or (h) seek, in a proceeding filed during the term of this Agreement or for one year after such term, an injunction of any portion of the Service based on patent infringement.

## 13. U.S. Government Rights.

If the use of the Service is being acquired by or on behalf of the U.S. Government or by a U.S. Government prime contractor or subcontractor (at any tier), in accordance with 48 C.F.R. 227.7202-4 (for Department of Defense (DOD) acquisitions) and 48 C.F.R. 2.101 and 12.212 (for non-DOD acquisitions), the Government's rights in the Software, including its rights to use, modify, reproduce, release, perform, display or disclose the Software or Documentation, will be subject in all respects to the commercial license rights and restrictions provided in this Agreement.

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Additionally, if Your Account and/or Properties are terminated, You will (i) delete all copies of the GAMC from all Properties and/or (ii) suspend any and all use of the SDKs within 3 business days of such termination. In the event of any termination (a) You will not be entitled to any refunds of any usage fees or any other fees, and (b) any outstanding balance for Service rendered through the date of termination will be immediately due and payable in full and (c) all of Your historical Report data will no longer be available to You.

## 15. Modifications to Terms of Service and Other Policies.

Google may modify these terms or any additional terms that apply to the Service to, for example, reflect changes to the law or changes to the Service. You should look at the terms regularly. Google will post notice of modifications to these terms at https://www.google.com/analytics/terms/, the Google Analytics Policies at www.google.com/analytics/policies/, or other policies referenced in these terms at the applicable URL for such policies. Changes will not apply retroactively and will become effective no sooner than 14 days after they are posted. If You do not agree to the modified terms for the Service, You should discontinue Your use Google Analytics. No amendment to or modification of this Agreement will be binding unless (i) in writing and signed by a duly authorized representative of Google, (ii) You accept updated terms online, or (iii) You continue to use the Service after Google has posted updates to the Agreement or to any policy governing the Service.

## 16. Miscellaneous, Applicable Law and Venue.

Google will be excused from performance in this Agreement to the extent that performance is prevented, delayed or obstructed by causes beyond its reasonable control. This Agreement (including any amendment agreed upon by the parties in writing) represents the complete agreement between You and Google concerning its subject matter, and supersedes all prior agreements and representations between the parties. If any provision of this Agreement is held to be unenforceable for any reason, such provision will be reformed to the extent necessary to make it enforceable to the maximum extent permissible so as to effect the intent of the parties, and the remainder

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personal jurisdiction of the courts located in Santa Clara County, California. The United Nations Convention on Contracts for the International Sale of Goods and the Uniform Computer Information Transactions Act do not apply to this Agreement. The Software is controlled by U.S. Export Regulations, and it may be not be exported to or used by embargoed countries or individuals. Any notices to Google must be sent to: Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA, with a copy to Legal Department, via first class or air mail or overnight courier, and are deemed given upon receipt. A waiver of any default is not a waiver of any subsequent default. You may not assign or otherwise transfer any of Your rights in this Agreement without Google's prior written consent, and any such attempt is void. The relationship between Google and You is not one of a legal partnership relationship, but is one of independent contractors. This Agreement will be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. The following sections of this Agreement will survive any termination thereof: 1, 4, 5, 6 (except the last two sentences), 7, 8, 9, 10, 11, 12, 14, 16, and 17.

## 17. Google Analytics for Firebase.

If You link a Property to Firebase (**"Firebase Linkage"**) as part of using the Service, the following terms, in addition to Sections 1-16 above, will also apply to You, and will also govern Your use of the Service, including with respect to Your use of Firebase Linkage. Other than as modified below, all other terms will stay the same and continue to apply. In the event of a conflict between this Section 17 and Sections 1-16 above, the terms in Section 17 will govern and control solely with respect to Your use of the Firebase Linkage.

    A. The following definition in Section 1 is modified as follows:

        a. "Hit" means a collection of interactions that results in data being sent to the Service and processed. Examples of Hits may include page view hits and ecommerce hits. A Hit can be a call to the Service by various libraries, but does not have to be so (e.g., a Hit can be delivered to the Service by other Google Analytics-supported protocols and mechanisms made available by the Service to You). For the sake of clarity, a Hit does not include certain events whose collection reflects interactions with certain Properties capable of supporting multiple data streams, and which may include screen views and custom events (the collection of events, an **"Enhanced Packet"**)

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within or to any other entity or personnel according to permissions set in Firebase and (ii) that Property may have certain Service settings modified by authorized personnel of Firebase (notwithstanding the settings You may have designated for that Property within the Service).

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# Google Analytics Terms of Service, last updated May 15, 2023, downloaded on March 28, 2024, available at https://web.archive.org/web/20240326120914/https://marketingplatform.google.com/about/analytics/terms/us/

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# Google Analytics Terms of Service

These Google Analytics Terms of Service (this **"Agreement"**) are entered into by Google LLC (**"Google"**) and the entity executing this Agreement (**"You"**). This Agreement governs Your use of the standard Google Analytics (the **"Service"**). BY CLICKING THE "I ACCEPT" BUTTON, COMPLETING THE REGISTRATION PROCESS, OR USING THE SERVICE, YOU ACKNOWLEDGE THAT YOU HAVE REVIEWED AND ACCEPT THIS AGREEMENT AND ARE AUTHORIZED TO ACT ON BEHALF OF, AND BIND TO THIS AGREEMENT, THE OWNER OF THIS ACCOUNT.

**Our Service is a business tool. You must only use our Service exclusively for purposes relating to your trade, business, craft or profession.**

In consideration of the parties' respective rights and obligations that are described in this Agreement, the parties agree as follows:

## 1. Definitions.

**"Account"** refers to the account for the Service and UA Properties and GA4 Properties. For UA Properties, all Views (as applicable) associated with a single UA Property will have their Hits aggregated before determining the charge for the Service for that UA Property.

**"Confidential Information"** includes any proprietary data and any other information disclosed by one party to the other in writing and marked "confidential" or disclosed orally and, within five business days, reduced to writing and marked "confidential". However, Confidential Information will not include any information that is or becomes known to the general public, which is already in the receiving party's possession prior to disclosure by a party or which is independently developed by the receiving party without the use of Confidential Information.

**"Customer Data"** or "Google Analytics Data" means the data that you collect, process or store using the Service concerning the characteristics and activities of Users.

**"Documentation"** means any accompanying documentation made available to You by Google for use with the Processing Software, including any documentation available

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GA4 Property, which may include but is not limited to a page view, transaction, screen view or other interactions. An Event can be a call to the Service from various libraries or otherwise delivered to the Service by OSCIs.

**"GA Property"** means a UA Property or GA4 Property, as applicable.

**"GA4 Property"** (formerly known as an 'App + Web' property) means the compilation of Google Analytics settings and information associated with the same 'Property ID' to which Events are sent.

**"GAMC"** means the Google Analytics Measurement Code, which is installed on a Property for the purpose of collecting Customer Data, together with any fixes, updates and upgrades provided to You.

**"Google Affiliates"** means Google and its wholly owned subsidiaries.

**"Hit"** means a base unit of measurement that is sent to the Service for processing through a UA Property. Examples of Hits may include page view hits and ecommerce hits. A Hit can be a call to the Service by various libraries or otherwise delivered to the Service by OSCIs.

**"OSCI"** means an **"Officially Supported Client Interface"**, which is a mechanism or protocol made available by or supported by Google that can be used to send Hits or Events, as applicable, to the Service.

**"Platform Home"** means the user interface through which You can access certain Google Marketing Platform-level functionality.

**"Processing Software"** means the Google Analytics server-side software and any upgrades, which analyzes the Customer Data and generates the Reports.

**"Property"** means any web page, application, other property or resource under Your control that sends data to Google Analytics.

**"Privacy Policy"** means the privacy policy on a Property.

**"Report"** means the resulting analysis shown at analytics.google.com, some of which may include analysis for a View or Events.

**"SDKs"** mean certain software development kits, which may be used or incorporated into a Property app for the purpose of collecting Customer Data, together with any fixes, updates, and upgrades provided to You.

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"**Software**" means the Processing Software, GAMC and/or SDKs.

"**Third Party**" means any third party (i) to which You provide access to Your Account or (ii) for which You use the Service to collect information on the third party's behalf.

"**UA Property**" means a "**Universal Analytics Property**", which is the compilation of Google Analytics settings and information associated with the same 'Property ID' to which Hits are sent.

"**Users**" means users and/or visitors to Your Properties.

"**View**" means the collection of settings that together determine the information to be included in, or excluded from, Reports for UA Properties. For example, a View could be established to view a small portion of a web site as a unique Report.

The words "**include**" and "**including**" mean "including but not limited to".

## 2. Fees and Service.

Subject to Section 15, the Service is provided without charge to You for (a) GA4 Properties and (b) UA Properties for up to 10 million Hits per UA Property per month. Google may change its fees and payment policies for the Service from time to time including the addition of costs for geographic data, the importing of cost data from search engines, or other fees charged to Google or another Google Affiliate by third party vendors for the inclusion of data in the Service reports. The changes to the fees or payment policies are effective upon Your acceptance of those changes which will be posted at www.google.com/analytics/. Unless otherwise stated, all fees are quoted in U.S. Dollars. Any outstanding balance becomes immediately due and payable upon termination of this Agreement and any collection expenses (including legal fees) incurred by Google will be included in the amount owed, and may be charged to the credit card or other billing mechanism associated with Your Google Ads account.

## 3. Member Account, Password, and Security.

To register for the Service, You must complete the registration process by providing Google with current, complete and accurate information as prompted by the registration form, including Your e-mail address (username) and password. You will protect Your passwords and take full responsibility for Your own, and third party, use of Your accounts. You are solely responsible for any and all activities that occur under

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or any other breach of security. Google Affiliates' support staff may, from time to time, log in to the Service under Your customer password in order to maintain the service, including to provide You assistance with technical or billing issues.

## 4. Nonexclusive License.

Subject to the terms and conditions of this Agreement, (a) Google grants You a limited, revocable, non-exclusive, non-sublicensable license to install, copy and use the GAMC and/or SDKs solely as necessary for You to use the Service on Your Properties or Third Party Properties; and (b) You may remotely access, view and download Your Reports stored at www.google.com/analytics/. You will not (and You will not allow any third party to) (i) copy, modify, adapt, translate or otherwise create derivative works of the Software or the Documentation; (ii) reverse engineer, decompile, disassemble or otherwise attempt to discover the source code of the Software, except as expressly permitted by the law in effect in the jurisdiction in which You are located; (iii) rent, lease, sell, assign or otherwise transfer rights in or to the Software, the Documentation or the Service; (iv) remove any proprietary notices or labels on the Software or placed by the Service; (v) use, post, transmit or introduce any device, software or routine which interferes or attempts to interfere with the operation of the Service or the Software; or (vi) use data labeled as belonging to a third party in the Service for purposes other than generating, viewing, and downloading Reports. You will comply with all applicable laws and regulations in Your use of and access to the Documentation, Software, Service and Reports.

## 5. Confidentiality and Beta Features.

Neither party will use or disclose the other party's Confidential Information without the other's prior written consent except for the purpose of performing its obligations under this Agreement or if required by law, regulation or court order; in which case, the party being compelled to disclose Confidential Information will give the other party as much notice as is reasonably practicable prior to disclosing the Confidential Information. Certain Service features are identified as "Alpha," "Beta," "Experiment," (either within the Service or elsewhere by Google) or as otherwise unsupported or confidential (collectively, "Beta Features"). You may not disclose any information from Beta Features or the terms or existence of any non-public Beta Features. Google and the Google Affiliates will have no liability (including any indemnification obligations) arising out of or related to any Beta Features. Any use of Beta Features will be solely at

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sole discretion, cease providing Beta Features as part of any Services.

## 6. Information Rights and Publicity.

Google will not share Your Customer Data or any Third Party's Customer Data with any third parties unless Google (i) has Your consent for any Customer Data or any Third Party's consent for the Third Party's Customer Data; (ii) concludes that it is required by law or has a good faith belief that access, preservation or disclosure of Customer Data is reasonably necessary to protect the rights, property or safety of Google, its users or the public; or (iii) provides Customer Data in certain limited circumstances to third parties to carry out tasks on Google's behalf (e.g., billing or data storage) with strict restrictions that prevent the data from being used or shared except as directed by Google. When this is done, it is subject to agreements that oblige those parties to process Customer Data only on Google's instructions and in compliance with this Agreement and appropriate confidentiality and security measures.

## 7. Privacy.

You will not and will not assist or permit any third party to pass information, hashed or otherwise, to Google that Google could use or recognize as personally identifiable information, except where permitted by, and subject to, the policies or terms of Google Analytics features made available to You, and only if, any information passed to Google for such Google Analytics feature is hashed using industry standards. You will have and abide by an appropriate Privacy Policy and will comply with all applicable laws, policies, and regulations relating to the collection of information from Users. You must post a Privacy Policy and that Privacy Policy must provide notice of Your use of cookies, identifiers for mobile devices (e.g., Android Advertising Identifier or Advertising Identifier for iOS) or similar technology used to collect data. You must disclose the use of Google Analytics, and how it collects and processes data. This can be done by displaying a prominent link to the site "How Google uses information from sites or apps that use our services", (located at www.google.com/policies/privacy/partners/, or any other URL that Google may provide from time to time). You will use commercially reasonable efforts to ensure that a User is provided with clear and comprehensive information about, and consents to, the storing and accessing of cookies or other information on the User's device where such activity occurs in connection with the Service and where providing such information and obtaining such consent is required by law.

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oogle.com/analytics/policies/ (or such other URL as Google may provide) as modified from time to time (the **"Google Analytics Policies"**).

You may participate in an integrated version of Google Analytics and certain Google advertising services ("Google Analytics Advertising Features"). If You use Google Analytics Advertising Features, You will adhere to the Google Analytics Advertising Features policy (available at support.google.com/analytics/bin/answer.py?hl=en&topic =2611283&answer=2700409). Your access to and use of any Google advertising service is subject to the applicable terms between You and Google regarding that service.

If You use the Platform Home, Your use of the Platform Home is subject to the Platform Home Additional Terms (or as subsequently re-named) available at https://su pport.google.com/marketingplatform/answer/9047313 (or such other URL as Google may provide) as modified from time to time (the "Platform Home Terms").

To the extent that Your use of the Service is within scope, You and Google agree to the Google Ads Data Processing Terms at https://business.safety.google/adsprocessorter ms/ (the "Processing Terms"). Google will not modify the Processing Terms, except as expressly permitted under the Processing Terms.

## 8. Indemnification.

To the extent permitted by applicable law, You will indemnify, hold harmless and defend Google Affiliates, at Your expense, against (a) any and all third-party claims, actions, proceedings, and suits brought against any Google Affiliate or any of their officers, directors, employees, agents or affiliates, and (b) all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, reasonable attorneys' fees and other litigation expenses) incurred by any Google Affiliate or any of their officers, directors, employees, agents or affiliates, arising out of or relating to such third-party claims, actions, proceedings, and suits; in each case as a result of (i) Your breach of any term or condition of this Agreement, (ii) Your use of the Service, (iii) Your violations of applicable laws, rules or regulations in connection with the Service, (iv) any representations and warranties made by You concerning any aspect of the Service, the Software or Reports to any Third Party; (v) any claims made by or on behalf of any Third Party pertaining directly or indirectly to Your use of the Service, the Software or Reports; (vi) violations of Your obligations of privacy to any Third Party; and/or (vii) any claims with respect to acts or omissions of any Third Party in connection with the Service, the Software or Reports. Google will provide You with written notice of any

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the right, at its own expense, to enforce this Section 8 on behalf of all Google Affiliates and assume the exclusive defense and control of any matter subject to indemnification by You.

## 9. Third Parties.

If You use the Service on behalf of the Third Party or a Third Party otherwise uses the Service through Your Account, whether or not You are authorized by Google to do so, then You represent and warrant that (a) You are authorized to act on behalf of, and bind to this Agreement, the Third Party to all obligations that You have under this Agreement, (b) Google may share with the Third Party any Customer Data that is specific to the Third Party Properties, and (c) You will not disclose Third Party's Customer Data to any other party without the Third Party's consent.

## 10. DISCLAIMER OF WARRANTIES.

TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT AS EXPRESSLY PROVIDED FOR IN THIS AGREEMENT, GOOGLE MAKES NO OTHER WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR USE AND NONINFRINGEMENT.

## 11. LIMITATION OF LIABILITY.

TO THE EXTENT PERMITTED BY APPLICABLE LAW, GOOGLE WILL NOT BE LIABLE FOR YOUR LOST REVENUES OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE DAMAGES, EVEN IF GOOGLE OR ITS SUBSIDIARIES AND AFFILIATES HAVE BEEN ADVISED OF, KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY. GOOGLE'S (AND ITS WHOLLY OWNED SUBSIDIARIES') TOTAL CUMULATIVE LIABILITY TO YOU OR ANY OTHER PARTY FOR ANY LOSS OR DAMAGES RESULTING FROM CLAIMS, DEMANDS, OR ACTIONS ARISING OUT OF OR RELATING TO THIS AGREEMENT WILL NOT EXCEED $500 (USD).

## 12. Proprietary Rights Notice.

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and to the Software not expressly granted to You in this Agreement are reserved and retained by Google and its licensors without restriction, including, Google's (and the other Google Affiliates') right to sole ownership of the Software and Documentation. Without limiting the generality of the foregoing, You agree not to (and not to allow any third party to): (a) sublicense, distribute, or use the Service or Software outside of the scope of the license granted in this Agreement; (b) copy, modify, adapt, translate, prepare derivative works from, reverse engineer, disassemble, or decompile the Software or otherwise attempt to discover any source code or trade secrets related to the Service or Documentation; (c) rent, lease, sell, assign or otherwise transfer rights in or to the Software, Documentation or the Service; (d) use, post, transmit or introduce any device, software or routine which interferes or attempts to interfere with the operation of the Service, Documentation or the Software; (e) use the trademarks, trade names, service marks, logos, domain names and other distinctive brand features or any copyright or other proprietary rights associated with the Service for any purpose without the express written consent of Google; (f) register, attempt to register, or assist anyone else to register any trademark, trade name, serve marks, logos, domain names and other distinctive brand features, copyright or other proprietary rights associated with Google (or any other Google Affiliate) other than in the name of Google (or another Google Affiliate, as the case may be); (g) remove, obscure, or alter any notice of copyright, trademark, or other proprietary right appearing in or on any item included with the Service or Software; or (h) seek, in a proceeding filed during the term of this Agreement or for one year after such term, an injunction of any portion of the Service based on patent infringement.

## 13. U.S. Government Rights.

If the use of the Service is being acquired by or on behalf of the U.S. Government or by a U.S. Government prime contractor or subcontractor (at any tier), in accordance with 48 C.F.R. 227.7202-4 (for Department of Defense (DOD) acquisitions) and 48 C.F.R. 2.101 and 12.212 (for non-DOD acquisitions), the Government's rights in the Software, including its rights to use, modify, reproduce, release, perform, display or disclose the Software or Documentation, will be subject in all respects to the commercial license rights and restrictions provided in this Agreement.

## 14. Term and Termination.

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the Service. Additionally, if Your Account and/or GA Properties are terminated, You will (i) delete all copies of the GAMC from all Properties and/or (ii) suspend any and all use of the SDKs within 3 business days of such termination. In the event of any termination (a) You will not be entitled to any refunds of any usage fees or any other fees, and (b) any outstanding balance for Service rendered through the date of termination will be immediately due and payable in full and (c) all of Your historical Report data will no longer be available to You.

## 15. Modifications to Terms of Service and Other Policies.

Google may modify these terms or any additional terms that apply to the Service to, for example, reflect changes to the law or changes to the Service. You should look at the terms regularly. Google will post notice of modifications to these terms at https://www. google.com/analytics/terms/, the Google Analytics Policies at www.google.com/analytics/policies/, or other policies referenced in these terms at the applicable URL for such policies. Changes will not apply retroactively and will become effective no sooner than 14 days after they are posted. If You do not agree to the modified terms for the Service, You should discontinue Your use of Google Analytics. No amendment to or modification of this Agreement will be binding unless (i) in writing and signed by a duly authorized representative of Google, (ii) You accept updated terms online, or (iii) You continue to use the Service after Google has posted updates to the Agreement or to any policy governing the Service.

## 16. Miscellaneous, Applicable Law and Venue.

(a) Google will be excused from performance in this Agreement to the extent that performance is prevented, delayed or obstructed by causes beyond its reasonable control. (b) This Agreement (including any amendment agreed upon by the parties in writing) represents the complete agreement between You and Google concerning its subject matter, and supersedes all prior agreements and representations between the parties. (c) If any provision of this Agreement is held to be unenforceable for any reason, such provision will be reformed to the extent necessary to make it enforceable to the maximum extent permissible so as to effect the intent of the parties, and the remainder of this Agreement will continue in full force and effect. (d) This Agreement will be governed by and construed under the laws of the state of California without reference to its conflict of law principles. In the event of any conflicts between foreign

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exclusive and personal jurisdiction of the courts located in Santa Clara County, California. The United Nations Convention on Contracts for the International Sale of Goods and the Uniform Computer Information Transactions Act do not apply to this Agreement. You will comply with all applicable export control and sanctions laws and regulations, including (i) the Export Administration Regulations ("EAR") maintained by the U.S. Department of Commerce, (ii) trade and economic sanctions maintained by the U.S. Treasury Department's Office of Foreign Assets Control, and (iii) the International Traffic in Arms Regulations ("ITAR") maintained by the U.S. Department of State. (f) Any notices to Google must be sent to: Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA, with a copy to Legal Department, via first class or air mail or overnight courier, and are deemed given upon receipt. (g) A waiver of any default is not a waiver of any subsequent default. (h) You may not assign or otherwise transfer any of Your rights in this Agreement without Google's prior written consent, and any such attempt is void. (i) The relationship between Google and You is not one of a legal partnership relationship, but is one of independent contractors. (j) This Agreement will be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. (k) The following sections of this Agreement will survive any termination thereof: 1, 4, 5, 6 (except the last two sentences), 7, 8, 9, 10, 11, 12, 14, 16, and 17.

## 17. Google Analytics and Firebase.

If You link a GA Property to Firebase ("**Firebase Linkage**") as part of using the Service, the following terms, in addition to Sections 1-16 above, will also apply to You, and will also govern Your use of the Service, including with respect to Your use of Firebase Linkage. Other than as modified below, all other terms will stay the same and continue to apply. In the event of a conflict between this Section 17 and Sections 1-16 above, the terms in Section 17 will govern and control solely with respect to Your use of the Firebase Linkage.

The following sentence is added to the end of Section 7 as follows:
If You link a GA Property to a Firebase project ("**Firebase Linkage**") (i) certain data from Your GA Property, including Customer Data, may be made accessible within or to any other entity or personnel specified in the applicable Firebase settings and (ii) that GA Property may have certain Service settings modified by authorized personnel specified in the applicable Firebase settings (notwithstanding the settings You may have designated for that GA Property within the Service).

Last Updated May 15, 2023

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- June 17, 2019

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# Appendix A-3

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## UNITED STATES DISTRICT COURT
## NORTHERN DISTRICT OF CALIFORNIA

| | |
|---|---|
| ANIBAL RODRIGUEZ, SAL CATALDO, JULIAN SANTIAGO, and SUSAN LYNN HARVEY individually and on behalf of all other similarly situated,<br><br>      Plaintiffs,<br><br> v.<br><br>GOOGLE LLC,<br><br>      Defendant. | Case No.:  3:20-cv-04688-RS<br><br>**DECLARATION OF SAL CATALDO IN SUPPORT OF PLAINTIFFS' MOTION FOR CLASS CERTIFICATION**<br><br>Judge: Hon. Richard Seeborg<br>Courtroom 3 – 17th Floor<br>Date: October 5, 2023<br>Time: 1:30 p.m. |

### DECLARATION OF SAL CATALDO

I, Sal Cataldo, declare as follows.

1.      My name is Sal Cataldo. I am over eighteen years of age and am competent to testify to and have personal knowledge of the facts set forth herein.

2.      I am a plaintiff in this lawsuit against Google, LLC ("Google"). Because I am very privacy minded and continually explore the options to control whether and how my data is used, I discovered Google's Web & App Activity ("WAA") and Supplemental Web & App Activity ("sWAA") privacy controls and used them to block Google from tracking me. Because Google is one of the largest tech companies on the planet, I turned WAA and sWAA off so that it could not collect, save, or use any of my Web & App Activity and supplemental Web & App Activity.

3.      I recall opening my main Google account in 2005, and years before this lawsuit was filed, I had read Google's Terms of Service, Privacy Policy, and other Google disclosures so that I knew what data Google did and did not collect when WAA and sWAA were turned off. I agreed to those terms. This included the Activity Controls screen, which included the WAA and sWAA options that Google offered as ways to stop Google from collecting, saving, and using my Web & App Activity and supplemental Web & App Activity when WAA and sWAA were turned off. All of these documents and disclosures from Google reiterated that I was in control of what information would and would not be shared with Google, and that when I turned off WAA and sWAA that Google would not have any access to my Web & App Activity and supplemental Web & App Activity.

4.      Although I had turned off WAA and sWAA and thought Google was not collecting, storing, or using my Web & App Activity and supplemental Web & App Activity, I learned about this lawsuit and I went back to check my WAA and sWAA settings and was surprised to learn that even though I vividly recalled turning WAA and sWAA off, those settings had been re-enabled. So I sought the advice of the attorneys in this case and decided to join the lawsuit to pursue Google for the privacy violations that it was engaging in.

# Appendix A-4

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## UNITED STATES DISTRICT COURT
## NORTHERN DISTRICT OF CALIFORNIA

| | |
|---|---|
| ANIBAL RODRIGUEZ, SAL CATALDO, JULIAN SANTIAGO, and SUSAN LYNN HARVEY individually and on behalf of all other similarly situated, <br><br>       Plaintiffs, <br> v. <br><br> GOOGLE LLC, <br><br>       Defendant. | Case No.:  3:20-cv-04688-RS <br><br> **DECLARATION OF SUSAN HARVEY IN SUPPORT OF PLAINTIFFS' MOTION FOR CLASS CERTIFICATION** <br><br> Judge: Hon. Richard Seeborg <br> Courtroom 3 – 17th Floor <br> Date: October 5, 2023 <br> Time: 1:30 p.m. |

### DECLARATION OF SUSAN HARVEY

I, Susan Harvey, declare as follows.

1.      My name is Susan Harvey. I am over eighteen years of age and am competent to testify to and have personal knowledge of the facts set forth herein.

2.      I am a plaintiff in this lawsuit against Google, LLC ("Google"). To protect my privacy, I use Google's Web & App Activity ("WAA") and Supplemental Web & App Activity ("sWAA") privacy controls to block Google from tracking me. I was the victim of identity theft when my Google account was accessed and fraudulent charges were made with the Google Play store, so I wanted to make sure that my Web & App Activity and supplemental Web & App Activity was not being stored anywhere. Because Google is a tech behemoth and collects enormous amounts of data and it's not clear to me what Google does or doesn't do with it afterward, I turned WAA and sWAA off so that it could not collect, save, or use any of my Web & App Activity and supplemental Web & App Activity.

3.      When I opened my main Google account in 2009, and years before this lawsuit was filed, I carefully read Google's Terms of Service, Privacy Policy, and other Google disclosures to understand what information was and was not collected if I chose to turn off WAA and sWAA. I agreed to those terms. This included Google's Activity Controls screen, which included the WAA and sWAA options that Google said are ways to prevent Google from collecting, saving, and using my Web & App Activity and supplemental Web & App Activity when I turned off WAA and sWAA. These documents and disclosures offered me control of what Google did or did not collect, and that when I turned off WAA and sWAA, Google would not have any access whatsoever to my Web & App Activity and supplemental Web & App Activity.

4.      Although I had turned off WAA and sWAA and thought Google was not collecting, storing, or using my Web & App Activity and supplemental Web & App Activity, I remember reading about this new lawsuit and it caught my attention because of the past problems I had with my Google account and how I specifically did not want Google collecting, saving, or using my

# Appendix A-5

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**UNITED STATES DISTRICT COURT**
**NORTHERN DISTRICT OF CALIFORNIA**

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| ANIBAL RODRIGUEZ, SAL CATALDO, JULIAN SANTIAGO, and SUSAN LYNN HARVEY individually and on behalf of all other similarly situated,<br><br>Plaintiffs,<br><br>v.<br><br>GOOGLE LLC,<br><br>Defendant. | Case No.: 3:20-cv-04688-RS<br><br>**DECLARATION OF ANIBAL RODRIGUEZ IN SUPPORT OF PLAINTIFFS' MOTION FOR CLASS CERTIFICATION**<br><br>Judge: Hon. Richard Seeborg<br>Courtroom 3 – 17th Floor<br>Date: October 5, 2023<br>Time: 1:30 p.m. |

**DECLARATION OF ANIBAL RODRIGUEZ**

I, Anibal Rodriguez, declare as follows.

1.      My name is Anibal Rodriguez. I am over eighteen years of age and am competent to testify to and have personal knowledge of the facts set forth herein.

2.      I am a plaintiff in this lawsuit against Google, LLC ("Google"). To protect my privacy, I use Google's Web & App Activity ("WAA") and Supplemental Web & App Activity ("sWAA") privacy controls to block Google from tracking me. Because Google is a one of if not the largest companies that collects comprehensive data on people, I turned WAA and sWAA off to prevent Google from collecting information about me and using it to track me.

3.      When I opened my Google account in 2014, and in the years before filing this lawsuit, I had read Google's Terms of Service, Privacy Policy, and other Google disclosures to understand what data was and was not collected when WAA and sWAA were turned off. I agreed to those terms. This included the Activity Controls page, and Google was never mentioned as someone that would still have access to my Web & App Activity and supplemental Web & App Activity when WAA and sWAA were turned off. All of these documents and disclosures from Google provided me with the option to control of what information would be shared with Google and when, and I expected that Google would not collect, save, or use my Web & App Activity and supplemental Web & App Activity when I had turned off WAA and sWAA.

4.      After learning about privacy concerns stemming from Google's data collection, I sought the advice of an expert and attorneys to further investigate those patterns. Then I found out that Google's representations and disclosures about WAA and sWAA were false and that Google instead collects massive amounts of data from my phone even when WAA and sWAA are turned off. So, I filed this lawsuit to pursue Google for this conduct and to protect my privacy and the privacy of those who turned off WAA and sWAA.

5.      I brought this case as a class action on behalf of two nationwide classes of individuals. The first nationwide class is:

# Appendix A-6

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| ANIBAL RODRIGUEZ, SAL CATALDO, JULIAN SANTIAGO, and SUSAN LYNN HARVEY individually and on behalf of all other similarly situated,<br><br>     Plaintiffs,<br> v.<br><br>GOOGLE LLC,<br><br>     Defendant. | Case No.:  3:20-cv-04688-RS<br><br>**DECLARATION OF JULIAN SANTIAGO SUPPORT OF PLAINTIFFS' MOTION FOR CLASS CERTIFICATION**<br><br>Judge: Hon. Richard Seeborg<br>Courtroom 3 – 17th Floor<br>Date: October 5, 2023<br>Time: 1:30 p.m. |

## DECLARATION OF JULIAN SANTIAGO

I, Julian Santiago, declare as follows.

1.      My name is Julian Santiago. I am over eighteen years of age and am competent to testify to and have personal knowledge of the facts set forth herein.

2.      I am a plaintiff in this lawsuit against Google, LLC ("Google"). Because I should be in control of what is or is not collected, I use Google's Web & App Activity ("WAA") and Supplemental Web & App Activity ("sWAA") privacy controls to block Google from tracking me. Because Google is a large company that collects massive amounts of data, I turned WAA and sWAA off so that it could not collect, save, or use any of my data.

3.      I opened my personal Google account around 2016 and my work Google account around 2020, and in the years before this lawsuit was filed, I recall reading Google's Terms of Service, Privacy Policy, and other Google disclosures so that I could understand what data Google did and did not collect when WAA and sWAA were turned off. I agreed to those terms. This included the Activity Controls page, which did not include Google as someone who would still have access to my Web & App Activity and supplemental Web & App Activity when WAA and sWAA were turned off. All of these documents and disclosures from Google gave me the option to control what information would be shared with Google and when, and I expected that Google would not collect, save, or use my Web & App Activity and supplemental Web & App Activity when I had turned off WAA and sWAA.

4.      Although I had turned off WAA and sWAA and thought Google was not collecting, storing, or using my Web & App Activity and supplemental Web & App Activity, when I read about this lawsuit, it led me to question whether that was true, so I contacted my current counsel to learn more about what was going on and to join the case.

5.      I joined this lawsuit with the understanding that the case has been brought as a class action on behalf of two nationwide classes of individuals. The first nationwide class is:

> Class 1: All individuals who, during the period beginning July 1, 2016 and continuing through the present (the "Class Period"), (a) had their "Web & App Activity" and/or "supplemental Web & App Activity" setting turned off and (b) whose activity on a non-

# Appendix A-7

PRIVACY POLICY

Last modified: June 28, 2016 (view archived versions)

There are many different ways you can use our services – to search for and share information, to communicate with other people or to create new content. When you share information with us, for example by creating a Google Account, we can make those services even better – to show you more relevant search results and ads, to help you connect with people or to make sharing with others quicker and easier. As you use our services, we want you to be clear how we're using information and the ways in which you can protect your privacy.

Our Privacy Policy explains:

- What information we collect and why we collect it.

- How we use that information.

- The choices we offer, including how to access and update information.

We've tried to keep it as simple as possible, but if you're not familiar with terms like cookies, IP addresses, pixel tags and browsers, then read about these key terms first. Your privacy matters to Google so whether you are new to Google or a long-time user, please do take the time to get to know our practices – and if you have any questions contact us.

## Information we collect

We collect information to provide better services to all of our users – from figuring out basic stuff like which language you speak, to more complex things like which ads you'll find most useful, the people who matter most to you online, or which YouTube videos you might like.

We collect information in the following ways:

- **Information you give us.** For example, many of our services require you to sign up for a Google Account. When you do, we'll ask for personal information, like your name, email address, telephone number or credit card to store with your account. If you want to take full advantage of the sharing features we offer, we might also ask you to create a publicly visible Google Profile, which may include your name and photo.

- **Information we get from your use of our services.** We collect information about the services that you use and how you use them, like when you watch a video on YouTube, visit a website that uses our advertising services, or view and interact with our ads and content. This information includes:

  - **Device information**

We collect device-specific information (such as your hardware model, operating system version, unique device identifiers, and mobile network information including phone number). Google may associate your device identifiers or phone number with your Google Account.

- **Log information**

  When you use our services or view content provided by Google, we automatically collect and store certain information in server logs. This includes:

  - details of how you used our service, such as your search queries.

  - telephony log information like your phone number, calling-party number, forwarding numbers, time and date of calls, duration of calls, SMS routing information and types of calls.

  - Internet protocol address.

  - device event information such as crashes, system activity, hardware settings, browser type, browser language, the date and time of your request and referral URL.

  - cookies that may uniquely identify your browser or your Google Account.

- **Location information**

When you use Google services, we may collect and process information about your actual location. We use various technologies to determine location, including IP address, GPS, and other sensors that may, for example, provide Google with information on nearby devices, Wi-Fi access points and cell towers.

- **Unique application numbers**

  Certain services include a unique application number. This number and information about your installation (for example, the operating system type and application version number) may be sent to Google when you install or uninstall that service or when that service periodically contacts our servers, such as for automatic updates.

- **Local storage**

  We may collect and store information (including personal information) locally on your device using mechanisms such as browser web storage (including HTML 5) and application data caches.

- **Cookies and similar technologies**

  We and our partners use various technologies to collect and store information when you visit a Google service, and this may include using cookies or similar technologies to identify your browser or device. We also

use these technologies to collect and store information when you interact with services we offer to our partners, such as advertising services or Google features that may appear on other sites. Our Google Analytics product helps businesses and site owners analyze the traffic to their websites and apps. When used in conjunction with our advertising services, such as those using the DoubleClick cookie, Google Analytics information is linked, by the Google Analytics customer or by Google, using Google technology, with information about visits to multiple sites.

Information we collect when you are signed in to Google, in addition to information we obtain about you from partners, may be associated with your Google Account. When information is associated with your Google Account, we treat it as personal information. For more information about how you can access, manage or delete information that is associated with your Google Account, visit the Transparency and choice section of this policy.

## How we use information we collect

We use the information we collect from all of our services to provide, maintain, protect and improve them, to develop new ones, and to protect Google and our users. We also use this information to offer you tailored content – like giving you more relevant search results and ads.

We may use the name you provide for your Google Profile across all of the services we offer that require a Google Account. In addition, we may replace past names associated with your Google Account so that you are represented consistently across all our services. If other users already have your email, or other information that identifies you,

we may show them your publicly visible Google Profile information, such as your name and photo.

If you have a Google Account, we may display your Profile name, Profile photo, and actions you take on Google or on third-party applications connected to your Google Account (such as +1's, reviews you write and comments you post) in our services, including displaying in ads and other commercial contexts. We will respect the choices you make to limit sharing or visibility settings in your Google Account.

When you contact Google, we keep a record of your communication to help solve any issues you might be facing. We may use your email address to inform you about our services, such as letting you know about upcoming changes or improvements.

We use information collected from cookies and other technologies, like pixel tags, to improve your user experience and the overall quality of our services. One of the products we use to do this on our own services is Google Analytics. For example, by saving your language preferences, we'll be able to have our services appear in the language you prefer. When showing you tailored ads, we will not associate an identifier from cookies or similar technologies with sensitive categories, such as those based on race, religion, sexual orientation or health.

Our automated systems analyze your content (including emails) to provide you personally relevant product features, such as customized search results, tailored advertising, and spam and malware detection.

We may combine personal information from one service with information, including personal information, from other Google services – for example to make it easier to share things with people you know. Depending on your account settings, your activity on

other sites and apps may be associated with your personal information in order to improve Google's services and the ads delivered by Google.

We will ask for your consent before using information for a purpose other than those that are set out in this Privacy Policy.

Google processes personal information on our servers in many countries around the world. We may process your personal information on a server located outside the country where you live.

## Transparency and choice

People have different privacy concerns. Our goal is to be clear about what information we collect, so that you can make meaningful choices about how it is used. For example, you can:

- Review and update your Google activity controls to decide what types of data, such as videos you've watched on YouTube or past searches, you would like saved with your account when you use Google services. You can also visit these controls to manage whether certain activity is stored in a cookie or similar technology on your device when you use our services while signed-out of your account.

- Review and control certain types of information tied to your Google Account by using Google Dashboard.

- View and edit your preferences about the Google ads shown to you on Google and across the web, such as which categories might interest you, using Ads Settings. You can also opt out of certain Google advertising services here.

- Adjust how the Profile associated with your Google Account appears to others.

- Control who you share information with through your Google Account.

- Take information associated with your Google Account out of many of our services.

- Choose whether your Profile name and Profile photo appear in shared endorsements that appear in ads.

You may also set your browser to block all cookies, including cookies associated with our services, or to indicate when a cookie is being set by us. However, it's important to remember that many of our services may not function properly if your cookies are disabled. For example, we may not remember your language preferences.

## Information you share

Many of our services let you share information with others. Remember that when you share information publicly, it may be indexable by search engines, including Google. Our services provide you with different options on sharing and removing your content.

## Accessing and updating your personal information

Whenever you use our services, we aim to provide you with access to your personal information. If that information is wrong, we strive to give you ways to update it quickly

or to delete it – unless we have to keep that information for legitimate business or legal purposes. When updating your personal information, we may ask you to verify your identity before we can act on your request.

We may reject requests that are unreasonably repetitive, require disproportionate technical effort (for example, developing a new system or fundamentally changing an existing practice), risk the privacy of others, or would be extremely impractical (for instance, requests concerning information residing on backup systems).

Where we can provide information access and correction, we will do so for free, except where it would require a disproportionate effort. We aim to maintain our services in a manner that protects information from accidental or malicious destruction. Because of this, after you delete information from our services, we may not immediately delete residual copies from our active servers and may not remove information from our backup systems.

## Information we share

We do not share personal information with companies, organizations and individuals outside of Google unless one of the following circumstances applies:

- **With your consent**

  We will share personal information with companies, organizations or individuals outside of Google when we have your consent to do so. We require opt-in consent for the sharing of any sensitive personal information.

- **With domain administrators**

If your Google Account is managed for you by a domain administrator (for example, for Google Apps users) then your domain administrator and resellers who provide user support to your organization will have access to your Google Account information (including your email and other data). Your domain administrator may be able to:

- view statistics regarding your account, like statistics regarding applications you install.

- change your account password.

- suspend or terminate your account access.

- access or retain information stored as part of your account.

- receive your account information in order to satisfy applicable law, regulation, legal process or enforceable governmental request.

- restrict your ability to delete or edit information or privacy settings.

Please refer to your domain administrator's privacy policy for more information.

- **For external processing**

We provide personal information to our affiliates or other trusted businesses or persons to process it for us, based on our instructions and in compliance with our Privacy Policy and any other appropriate confidentiality and security measures.

- **For legal reasons**

We will share personal information with companies, organizations or individuals outside of Google if we have a good-faith belief that access, use, preservation or disclosure of the information is reasonably necessary to:

- meet any applicable law, regulation, legal process or enforceable governmental request.

- enforce applicable Terms of Service, including investigation of potential violations.

- detect, prevent, or otherwise address fraud, security or technical issues.

- protect against harm to the rights, property or safety of Google, our users or the public as required or permitted by law.

We may share non-personally identifiable information publicly and with our partners – like publishers, advertisers or connected sites. For example, we may share information publicly to show trends about the general use of our services.

If Google is involved in a merger, acquisition or asset sale, we will continue to ensure the confidentiality of any personal information and give affected users notice before personal information is transferred or becomes subject to a different privacy policy.

## Information security

We work hard to protect Google and our users from unauthorized access to or unauthorized alteration, disclosure or destruction of information we hold. In particular:

- We encrypt many of our services using SSL.

- We offer you two step verification when you access your Google Account, and a Safe Browsing feature in Google Chrome.

- We review our information collection, storage and processing practices, including physical security measures, to guard against unauthorized access to systems.

- We restrict access to personal information to Google employees, contractors and agents who need to know that information in order to process it for us, and who are subject to strict contractual confidentiality obligations and may be disciplined or terminated if they fail to meet these obligations.

## When this Privacy Policy applies

Our Privacy Policy applies to all of the services offered by Google Inc. and its affiliates, including YouTube, services Google provides on Android devices, and services offered on other sites (such as our advertising services), but excludes services that have separate privacy policies that do not incorporate this Privacy Policy.

Our Privacy Policy does not apply to services offered by other companies or individuals, including products or sites that may be displayed to you in search results, sites that may include Google services, or other sites linked from our services. Our Privacy Policy does not cover the information practices of other companies and organizations who advertise our services, and who may use cookies, pixel tags and other technologies to serve and offer relevant ads.

## Compliance and cooperation with regulatory authorities

We regularly review our compliance with our Privacy Policy. We also adhere to several self regulatory frameworks. When we receive formal written complaints, we will contact the person who made the complaint to follow up. We work with the appropriate regulatory authorities, including local data protection authorities, to resolve any complaints regarding the transfer of personal data that we cannot resolve with our users directly.

## Changes

Our Privacy Policy may change from time to time. We will not reduce your rights under this Privacy Policy without your explicit consent. We will post any privacy policy changes on this page and, if the changes are significant, we will provide a more prominent notice (including, for certain services, email notification of privacy policy changes). We will also keep prior versions of this Privacy Policy in an archive for your review.

## Specific product practices

The following notices explain specific privacy practices with respect to certain Google products and services that you may use:

- Chrome and Chrome OS

- Play Books

- Payments

- Fiber

- Project Fi

- Google Apps for Education

For more information about some of our most popular services, you can visit the Google Product Privacy Guide.

## Other useful privacy and security related materials

Further useful privacy and security related materials can be found through Google's policies and principles pages, including:

- Information about our technologies and principles, which includes, among other things, more information on

    - how Google uses cookies.

    - technologies we use for advertising.

    - how we recognize patterns like faces.

- A page that explains what data is shared with Google when you visit websites that use our advertising, analytics and social products.

- The Privacy Checkup tool, which makes it easy to review your key privacy settings.

- Google's safety center, which provides information on how to stay safe and secure online.

## "access to your personal information"

For example, with Google Dashboard you can quickly and easily see some of the data associated with your Google Account. Learn more.

## "ads you'll find most useful"

For example, if you frequently visit websites and blogs about gardening, you may see ads related to gardening as you browse the web. Learn more.

## "advertising services"

For example, if you frequently visit websites and blogs about gardening that show our ads, you may start to see ads related to this interest as you browse the web. Learn more.

## "and other sensors"

Your device may have sensors that provide information to assist in a better understanding of your location. For example, an accelerometer can be used to determine things like speed, or a gyroscope to figure out direction of travel. Learn more.

## "collect information"

This includes information like your usage data and preferences, Gmail messages, G+ profile, photos, videos, browsing history, map searches, docs, or other Google-hosted content. Learn more.

## "combine personal information from one service with information, including personal information, from other Google services"

For example, when you're signed in to your Google Account and search on Google, you can see search results from the public web, along with pages, photos, and Google+ posts from your friends and people who know you or follow you on Google+ may see your posts and profile in their results. Learn more.

## "connect with people"

For example, you could get suggestions of people you might know or want to connect with on Google+, based on the connections you have with people on other Google products, like Gmail and people who have a connection with you may see your profile as a suggestion. Learn more.

## "credit card"

Whilst we currently don't ask for a credit card during sign up, verifying your age through a small credit card transaction is one way to confirm that you meet our age requirements in case your account was disabled after you have entered a birthday indicating you are not old enough to have a Google Account. Learn more.

## "develop new ones"

For example, Google's spell checking software was developed by analyzing previous searches where users had corrected their own spelling. Learn more.

## "device identifiers"

Device identifiers let Google know which unique device you are using to access our services, which can be used to customise our service to your device or analyse any device issues related to our services. Learn more.

## "device-specific information"

For example, when you visit Google Play from your desktop, Google can use this information to help you decide on which devices you'd like your purchases to be available for use. Learn more.

## "improve your user experience"

For example, cookies allow us to analyse how users interact with our services. Learn more.

## "legal process or enforceable governmental request"

Like other technology and communications companies, Google regularly receives requests from governments and courts around the world to hand over user data. Our legal team reviews each and every request, regardless of type, and we frequently push back when the requests appear to be overly broad or don't follow the correct process. Learn more.

## "limit sharing or visibility settings"

For example, you can choose your settings so your name and photo do not appear in an ad. Learn more.

## "linked with information about visits to multiple sites"

Google Analytics is based on first-party cookies. Data generated through Google Analytics can be linked, by the Google Analytics customer or by Google, using Google technology, to third-party cookies, related to visits to other websites, for instance when an advertiser wants to use its Google Analytics data to create more relevant ads, or to further analyze its traffic. Learn more.

## "maintain"

For example, we continuously monitor our systems to check that they are working as intended and in order to detect and fix errors. Learn more.

## "may collect and process information about your actual location"

For example, Google Maps can center the maps view on your current location. Learn more.

## "may not function properly"

For example, we use a cookie called 'lbcs' which makes it possible for you to open many Google Docs in one browser. Learn more.

## "and our partners"

We allow trusted businesses to use cookies or similar technologies for advertising and research purposes on our services. Learn more.

## "phone number"

For example, if you add a phone number as a recovery option, if you forget your password Google can send you a text message with a code to enable you to reset it. Learn more.

## "protect Google and our users"

For example, if you're concerned about unauthorized access to your email, "Last account activity" in Gmail shows you information about recent activity in your email, such as the IP addresses that accessed your mail, the associated location, as well as the time and date. Learn more.

## "protect"

For example, one reason we collect and analyze IP addresses and cookies is to protect our services against automated abuse. Learn more.

## "provide"

For example, the IP address assigned to your device is used to send the data you requested back to your device. Learn more.

## "sharing"

For example, with Google+, you have many different sharing options. Learn more.

## "sharing with others quicker and easier"

For example, if someone is already a contact, Google will autocomplete their name if you want to add them to a message in Gmail. Learn more.

## "the people who matter most to you online"

For example, when you type an address in the To, Cc, or Bcc field of a message you're composing, Gmail will suggest addresses from your Contacts list. Learn more.

## "to make it easier to share things with people you know"

For example, if you have communicated with someone via Gmail and want to add them to a Google Doc or an event in Google Calendar, Google makes it easy to do so by autocompleting their email address when you start to type in their name. Learn more.

## "view and interact with our ads"

For example, we regularly report to advertisers on whether we served their ad to a page and whether that ad was likely to be seen by users (as opposed to, for example, being on part of the page to which users did not scroll). Learn more.

## "We may share aggregated, non-personally identifiable information publicly"

When lots of people start searching for something, it can provide very useful information about particular trends at that time. Learn more.

## "Wi-Fi access points and cell towers"

For example, Google can approximate your device's location based on the known location of nearby cell towers. Learn more.

## "more relevant search results"

For example, we can make search more relevant and interesting for you by including photos, posts, and more from you and your friends. Learn more.

## "removing your content"

For example, you can delete your Web & App Actvity, your blog, a Google Site you own, your YouTube Channel, your Google+ profile or your entire Google account. Learn more.

## "to show trends"

You can see some of these at Google Trends and YouTube Trends. Learn more.

## "your activity on other sites and apps"

This activity might come from your use of Google products like Chrome Sync or from your visits to sites and apps that partner with Google. Many websites and apps partner with Google to improve their content and services. For example, a website might use our advertising services (like AdSense) or analytics tools (like Google Analytics). These products share information about your activity with Google and, depending on your account settings and the products in use (for instance, when a partner uses Google

Analytics in conjunction with our advertising services), this data may be associated with your personal information. Learn more.

## *How Google uses your data for ads*

**as published on September 26, 2016,
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**https://web.archive.org/web/20160926141132/https://privacy.google.com/how-ads-work.html**

G   **Privacy**                                                          Menu ⌄

### How Ads Work

# We do not sell your personal information to anyone.

G **Privacy**

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and mobile apps that partner with us. Ads help keep our services free for everyone. We use data to show you these ads, but we do not sell personal information like your name, email address, and payment information.



## We use data to make ads relevant

We try to show you useful ads by using data collected from your devices, including your searches and location, websites and apps you have used, videos and ads you have seen, and personal information you have given us, such as your age

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If you are signed in and depending on your Ads Settings, this data informs the ads you see across your devices. So if you visit a travel website on your computer at work, you might see ads about airfares to Paris on your phone later that night.
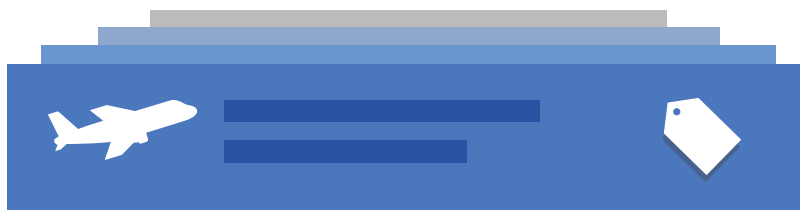


## Advertisers pay only for ads that people see or tap

When advertisers run ad campaigns with us, they pay us based only on how those ads actually perform — never on your personal information. That could include each time someone views or taps an ad, or takes an action having seen an ad, like downloading an app or filling out a request form.

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## We show advertisers how well their campaigns worked

We give advertisers data about their ads' performance, but we do so without revealing any of your personal information. At every point in the process of showing you ads, we keep your personal information protected and private.

## How ads work on Google services and partner sites

We use data to show ads that are useful to you, whether they are on Google services or websites and mobile apps that partner with us.
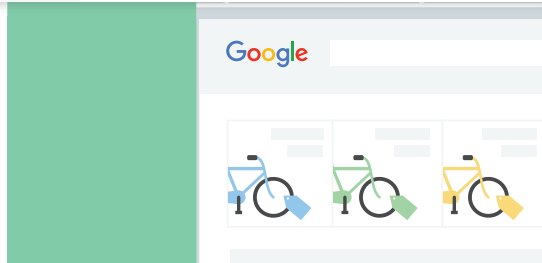
![G] **Privacy**                                                                  Menu ⌄
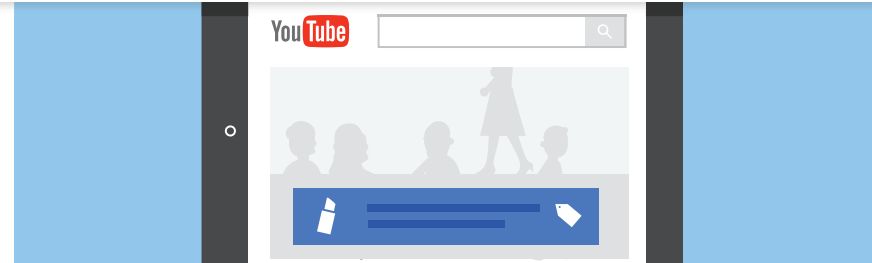
**How Search ads work**                          **How YouTube ads work**

→                                                →
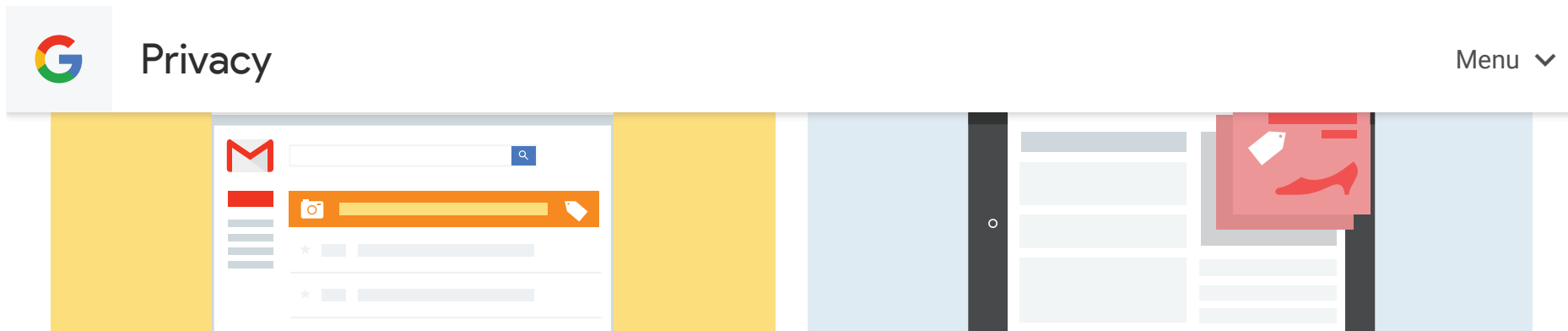
**Privacy**

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**How Gmail ads work**

**How ads work on Google partner sites**

→                                                              →

# Take control of your Google ads experience

We give you tools to control the types of ads you see whether you are signed in or signed out.

Privacy
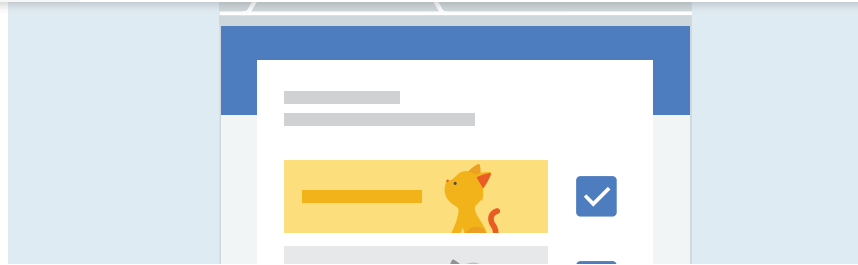
**Control ads based on your preferences**
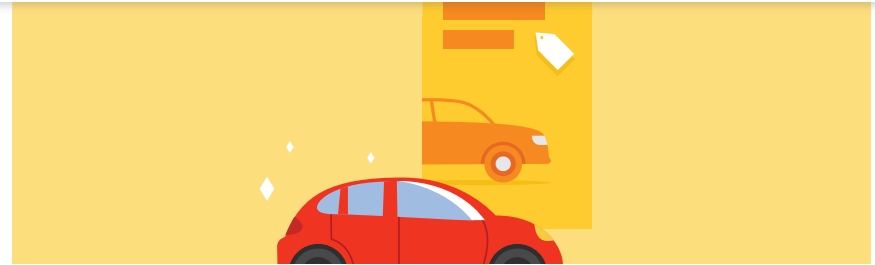
**Remove ads you do not want to see**

→                                                    →
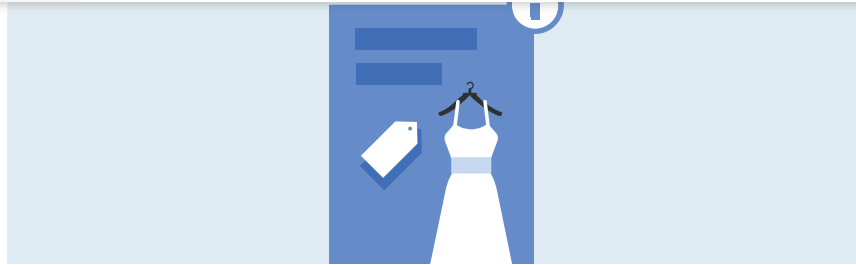
**G** **Privacy**

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**Learn what data we use to show you ads**

→

G  **Privacy**                                                          Menu ⌄

Safer Internet

# We help make the Internet safer for everyone.

![G] Privacy                                                              Menu ⌄

safer, we find opportunities to share it for everyone's benefit. And as threats change over time, our adaptive, forward-looking measures pave the way for other companies to follow.
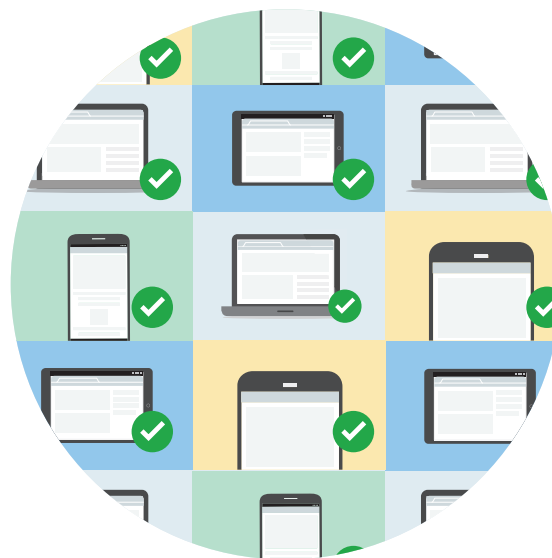


## Safe Browsing protects more than just Chrome users

We originally built our Safe Browsing technology to protect Chrome users from malware and phishing attempts by alerting them when they try to visit dangerous websites. To make the Internet safer for everyone, we made this

**Privacy**                                                Menu ⌄

We also alert website owners when their sites have security flaws and offer free tools to help them quickly fix the problems. By continuing to share new security technology as we develop it, we help build an Internet that is safer for everyone.
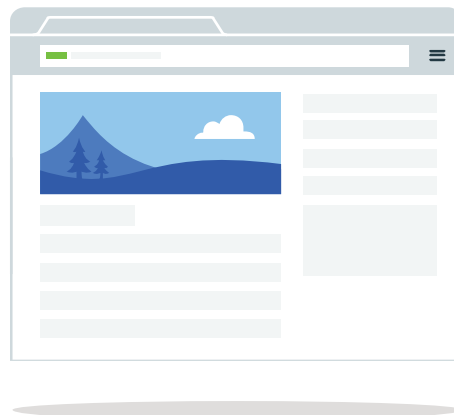


## We use HTTPS to keep you safer while you browse the Internet

Connecting to our services through HTTPS encryption protects you from prying eyes and malicious hackers to make sure you get only to what and where you want. To motivate websites to adopt this added security, we have made HTTPS

Privacy

Menu ⌄
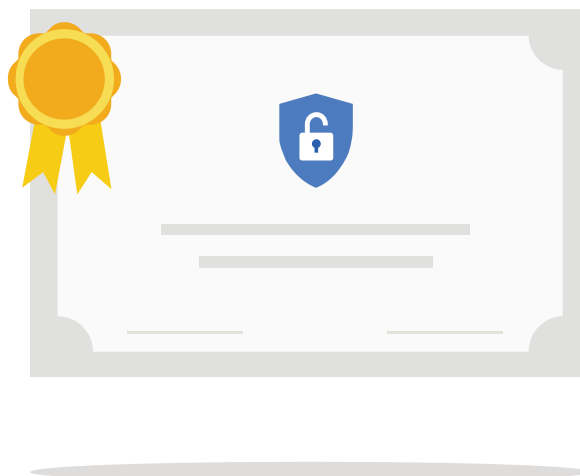
# We create security rewards to uncover vulnerabilities

At Google we create security rewards programs that pay independent researchers to find vulnerabilities in our services and create security fixes. Every year we award millions of dollars in research grants and bug bounties. We currently use security reward programs for many Google products, like Chrome and Android.

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# We make our security tools available to developers

We share our security technology when we believe it can provide value for others. For example, we make our Google Cloud Security Scanner freely available to developers so they can scan and analyze their web applications in App Engine for security vulnerabilities.

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# We share data about our practices to foster a safer Internet

Since 2010 Google has published the Transparency Report, which features statistics on things like copyright removals, government requests for user data, and security initiatives like Safe Browsing. We also share data on the industry's adoption of encryption for websites and email. We do this not only to share our progress with our users, but to encourage others to adopt stronger security standards in the interest of a safer Internet for all.

**G** Privacy

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Your Data

# We want you to understand what data we collect and use.

G    **Privacy**                                                        Menu ⌄

Here are the three main types of data we collect:



# Things you do

When you use our services — for example, do a search on Google, get directions on Google Maps, or watch a video on YouTube — we collect data to make these services work for you. This can include:

• Things you search for

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- Ads you click on or tap
- Your location
- Device information
- IP address and cookie data

## Things you create

If you are signed in with your Google Account, we store and protect what you create using our services. This can include:

G  **Privacy**                                                    Menu ⌄

- Calendar events
- Photos and videos you upload
- Docs, Sheets, and Slides on Drive



## Things that make you "you"

When you sign up for a Google account, we keep the basic information that you give us. This can include your:

- Name

G     Privacy                                                      Menu ∨

- Gender
- Phone number
- Country

# How data improves Google services

Here are a few ways we use data to make our services faster, smarter, and more useful to you.

![Google G logo] Privacy

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**G** Privacy

Menu ⌄

# Take control of your Google experience

Here are some tools you can use anytime to manage your privacy.

**G** **Privacy**                                                    Menu ⌄

Privacy Policy

My Account

*Advertising – Privacy & Terms*

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[https://web.archive.org/web/20160629135224/https://www.google.com/policies/technologies/ads/](https://web.archive.org/web/20160629135224/https://www.google.com/policies/technologies/ads/)

The Wayback Machine - https://web.archive.org/web/20160629135224/http://www.google.com/policies/technologies/ads/

Google

# Advertising

Advertising keeps Google and many of the websites and services you use free of charge. We work hard to make sure that ads are safe, unobtrusive, and as relevant as possible. For example, you won't see pop-up ads on Google, and we terminate the accounts of hundreds of thousands of publishers and advertisers that violate our policies each year – including ads containing malware, ads for counterfeit goods, or ads that attempt to misuse your personal information.

**How Google uses cookies in advertising**

Cookies help to make advertising more effective. Without cookies, it's harder for an advertiser to reach its audience, or to know how many ads were shown and how many clicks they received.

Many websites, such as news sites and blogs, partner with Google to show ads to their visitors. Working with our partners, we may use cookies for a number of purposes, such as to stop you from seeing the same ad over and over again, to detect and stop click fraud, and to show ads that are likely to be more relevant (such as ads based on websites you have visited).

We store a record of the ads we serve in our logs. These server logs typically include your web request, IP address, browser type, browser language, the date and time of your request, and one or more cookies that may uniquely identify your browser. We store this data for a number of reasons, the most important of which are to improve our services and to maintain the security of our systems. We anonymize this log data by removing part of the IP address (after 9 months) and cookie information (after 18 months).

## Our advertising cookies

To help our partners manage their advertising and websites, we offer many products, including AdSense, AdWords, Google Analytics, and a range of DoubleClick-branded services. When you visit a page that uses one of these products, either on one of Google's sites or one of our partners', various cookies may be sent to your browser.

These may be set from a few different domains, including google.com, doubleclick.net, invitemedia.com, admeld.com, googlesyndication.com, or googleadservices.com. Some of our advertising products enable our partners to use other services in conjunction with ours (like an ad measurement and reporting service), and these services may send their own cookies to your browser. These cookies will be set from their domains.

See more detail about the types of cookies used by Google and our partners and how we use them.

## How you can control advertising cookies

You can use Ads Settings to manage the Google ads you see and opt out of Ads Personalization. Even if you opt out of Ads Personalization, you may still see ads based on factors such as your general location derived from your IP address, your browser type, and your search terms.

You can also manage many companies' cookies used for online advertising via the consumer choice tools created under self-regulation programs in many countries, such as the US-based aboutads.info choices page or the EU-based Your Online Choices.

Finally, you can manage cookies in your web browser.

**Other technologies used in advertising**

Google's advertising systems may use other technologies, including Flash and HTML5, for functions like display of interactive ad formats. We may use the IP address, for example, to identify your general location. We may also select advertising based on information about your computer or device, such as your device model, browser type, or sensors in your device like the accelerometer.

## Location

Google's ad products may receive or infer information about your location from a variety of sources. For example, we may use the IP address to identify your general location; we may receive precise location from your mobile device; we may infer your location from your search queries; and websites or apps that you use may send information about your location to us. Google uses location information in our ads products to infer demographic information, to improve the relevance of the ads you see, to measure ad performance and to report aggregate statistics to advertisers.

## Advertising identifiers on mobile devices

To serve ads in services where cookie technology may not be available (for example, in mobile applications), we may use technologies that perform similar functions to cookies. Sometimes Google links the identifier used for advertising on mobile applications to an advertising cookie on the same device in order to coordinate ads across your mobile apps and mobile browser. This can happen, for example, when you see an ad within an app that launches a web page in your mobile browser. This also helps us improve the reports we give to our advertisers on the effectiveness of their campaigns.

To opt out of personalized ads in apps on your mobile device, follow the instructions below.

### Android

1. Find Google Settings in one of these places (depending on your device):
    1. A separate app called **Google Settings**
    2. In your main **Settings** app, scroll down and tap **Google**
2. Tap **Ads**
3. Switch on **Opt out of interest-based ads**

### iOS

Devices with iOS use Apple's Advertising Identifier. To learn more about your choices for use of this identifier, visit the **Settings** app on your device.

## What determines the ads by Google that I see?

Many decisions are made to determine which ad you see.

Sometimes the ad you see is based on your current or past location. Your IP address is usually a good indication of your approximate location. So you might see an ad on the homepage of YouTube.com that promotes a forthcoming movie in your country, or a search for 'pizza' might return results for pizza places in your town.

Sometimes the ad you see is based on the context of a page. If you're looking at a page of gardening tips, you might see ads for gardening equipment.

Sometimes you might also see an ad on the web that's based on your app activity or activity on Google services; an in-app ad that's based on your web activity; or an ad based on your activity on another device.

Sometimes the ad you see on a page is served by Google but selected by another company. For example, you might have registered with a newspaper website. From information you've given the newspaper, it can make decisions about which ads to show you, and it can use Google's ad serving products to deliver those ads.

You may also see ads on Google products and services, including Search, Gmail, and YouTube, based on information, such as your email address, that you provided to advertisers and the advertisers then shared with Google.

## Why am I seeing ads by Google for products I've viewed?

You may see ads for products you previously viewed. Let's suppose you visit a website that sells golf clubs, but you don't buy those clubs on your first visit. The website owner might want to encourage you to return and complete your purchase. Google offers services that let website operators target their ads to people who visited their pages.

For this to work, Google either reads a cookie that's already in your browser or places a cookie in your browser when you visit the golfing site (assuming your browser lets this happen).

When you visit another site that works with Google, which may have nothing to do with golfing, you might see an ad for those golf clubs. That's because your browser sends Google the same cookie. In turn, we may use that cookie to serve you an ad that could encourage you to buy those golf clubs.

Your visit to the golfing site may also be used by Google to show you personalized ads when you later search for golf clubs on Google.

We do have restrictions on this type of ad. For example, we prohibit advertisers from selecting an audience based on sensitive information, such as health information or religious beliefs.

Learn more about Google ads.

## *Key Terms – Privacy & Terms*

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**https://web.archive.org/web/20160627215305/https://www.google.com/policies/privacy/key-terms/**

The Wayback Machine - https://web.archive.org/web/20160627215305/http://www.google.com:80/policies/privacy/key-terms/

Google

# Key terms

- Affiliates
- Application data cache
- Browser web storage
- Cookies and similar technologies
- Device
- Google Account
- HTTP Referrer
- IP address
- Non-personally identifiable information
- Personal information
- Pixel tag
- Sensitive Categories
- Sensitive personal information
- Server logs
- Unique device identifier

**Affiliates**

An affiliate is an entity that belongs to the Google group of companies.

**Application data cache**

An application data cache is a data repository on a device. It can, for example, enable a web application to run without an internet connection and improve the performance of the application by enabling faster loading of content.

**Browser web storage**

Browser web storage enables websites to store data in a browser on a device. When used in "local storage" mode, it enables data to be stored across sessions (for example, so that the data are retrievable even after the browser has been closed and reopened). One technology that facilitates web storage is HTML 5.

**Cookies and similar technologies**

A cookie is a small file containing a string of characters that is sent to your computer when you visit a website. When you visit the website again, the cookie allows that site to recognize your browser. Cookies may store user preferences and other information. You can reset your browser to refuse all cookies or to indicate when a cookie is being sent. However, some website features or services may not function properly without cookies. Other technologies are used for similar purposes as a cookie on other platforms where cookies are not available or applicable, such as the Advertising ID available on Android mobile devices. Learn more about how Google uses cookies and how Google uses data, including cookies, when you use our partners' sites or apps.

**Device**

A device is a computer that can be used to access Google services. For example, a device could be a desktop, tablet or smartphone.

**Google Account**

You may access some of our services by signing up for a Google Account and providing us with some personal information (typically your name, email address and a password). This account information will be used to authenticate you when you access Google services and protect your account from unauthorized access by others. You can edit or terminate your account at any time through your Google Account settings.

**HTTP Referrer**

An HTTP Referrer is information transmitted to a destination webpage by a web browser, typically when you click a link to that webpage. The HTTP Referrer contains the URL of the last webpage the browser visited.

**IP address**

Every device connected to the Internet is assigned a number known as an Internet protocol (IP) address. These numbers are usually assigned in geographic blocks. An IP address can often be used to identify the location from which a device is connecting to the Internet.

**Non-personally identifiable information**

This is information that is recorded about users so that it no longer reflects or references an individually identifiable user.

**Personal information**

This is information which you provide to us which personally identifies you, such as your name, email address or billing information, or other data which can be reasonably linked to such information by Google, such as information we associate with your Google account.

**Pixel tag**

A pixel tag is a type of technology placed on a website or within the body of an email for the purpose of tracking activity on websites, or when emails are opened or accessed, and is often used in combination with cookies.

**Sensitive Categories**

An advertising category may be sensitive if it relates to topics such as race, religion, sexual orientation or health. When showing you tailored ads, we may associate a cookie or anonymous identifier with interests such as "Cooking and Recipes" or "Air Travel," but not with sensitive categories. We impose a similar policy on our advertisers.

**Sensitive personal information**

This is a particular category of personal information relating to confidential medical facts, racial or ethnic origins, political or religious beliefs or sexuality.

**Server logs**

Like most websites, our servers automatically record the page requests made when you visit our sites. These "server logs" typically include your web request, Internet Protocol address, browser type, browser language, the date and time of your request and one or more cookies that may uniquely identify your browser.

Here is an example of a typical log entry where the search is for "cars", followed by a breakdown of its parts:

```
123.45.67.89 - 25/Mar/2003 10:15:32 -
http://www.google.com/search?q=cars -
Firefox 1.0.7; Windows NT 5.1 - 740674ce2123e969
```

- `123.45.67.89` is the Internet Protocol address assigned to the user by the user's ISP; depending on the user's service, a different address may be assigned to the user by their service provider each time they connect to the Internet;
- `25/Mar/2003 10:15:32` is the date and time of the query;
- `http://www.google.com/search?q=cars` is the requested URL, including the search query;
- `Firefox 1.0.7; Windows NT 5.1` is the browser and operating system being used; and
- `740674ce2123a969` is the unique cookie ID assigned to this particular computer the first time it visited Google. (Cookies can be deleted by users. If the user has deleted the cookie from the computer since the last time s/he visited Google, then it will be the unique cookie ID assigned to the user the next time s/he visits Google from that particular computer).

**Unique device identifier**

A unique device identifier (sometimes called a universally unique ID or UUID) is a string of characters that is incorporated into a device by its manufacturer and can be used to uniquely identify that device (for example an IMEI-number of a mobile phone). Different device identifiers vary in how permanent they are, whether they can be reset by users, and how they can be accessed. A given device may have several different unique device identifiers. Unique device identifiers can be used for various purposes, including security and fraud detection, syncing services such as a user's email inbox, remembering the user's preferences and providing relevant advertising.

*How Google uses data when you use our apps –*
*Privacy & Terms*

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Google

# How Google uses data when you use our partners' sites or apps

Many websites use Google technologies to improve their content and keep it free. When you visit a website that uses our advertising products (like AdSense), social products (like the +1 button), or analytics tools (Google Analytics), your web browser automatically sends certain information to Google. This includes, for example, the web address of the page that you're visiting and your IP address. We may also set cookies on your browser or read cookies that are already there.

Similarly, apps that partner with Google can send us information such as the name of the app and an identifier that helps us to determine which ads we've served to other apps on your device. If you are signed in to your Google Account, and depending on your Account settings, we may add that information to your Account, and treat it as personal information.

**How we use the information sent by your browser**

When you visit websites or use apps that use Google technologies, we may use the information we receive from those websites and apps to, for example:

- Make ads more effective
- Provide reports of ads activity to advertisers and websites hosting the ads, and to ensure payment to those website publishers
- Help website and app owners using Google Analytics to understand how visitors engage with their sites or apps
- Improve your Google+ experience
- Detect and defend against fraud and other security risks to protect users and partners
- Meet our legal duties
- Improve our products

**How you can control the information sent to Google**

For tips and advice on staying safe and managing your data online, visit the Google Safety Center.

Here are some of the ways you can control the information that is shared by your web browser when you visit or interact with Google services on partners' sites across the web:

- Ads Settings helps you control the ads by Google that you see across the web. You can learn how ads are selected for you, opt out of Ads Personalization, and block specific advertisers. Learn more about advertising.
- If you are signed in to your Google Account, and depending on your Account settings, you can see and edit some of the information we collect from the sites and apps you have visited.

- Many sites across the web use Google Analytics to understand how visitors engage with their sites or apps. If you don't want Analytics to be used in your browser, you can install the Google Analytics browser add-on. Learn more about Google Analytics and privacy.
- Google makes it easy for you to make recommendations for your friends - for example, by clicking the +1 button on content you like. Some of your +1s may show your name and Google+ profile photo in ads, but you can opt out if you don't want to appear in ads. You can also visit the +1 tab on your Google+ profile to review and manage all of your +1's. Learn more about how to get to your +1 tab.
- Incognito mode in Chrome allows you to browse the web without recording webpages and files in your browser history. Cookies are deleted after you've closed all of your incognito windows and tabs, and your bookmarks and settings are stored until you delete them. Learn more about cookies.

*Advertising – Privacy & Terms*

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**https://web.archive.org/web/20180404001532/https://policies.google.com/technologies/ads**

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Google

Privacy & Terms

☰

Technologies

Advertising

How Google uses cookies

How Google uses pattern recognition

Types of location data used by Google

How Google Wallet uses credit card numbers

How Google Voice works

Google Product Privacy Guide

# Advertising

Advertising keeps Google and many of the websites and services you use free of charge. We work hard to make sure that ads are safe, unobtrusive, and as relevant as possible. For example, you won't see pop-up ads on Google, and we terminate the accounts of hundreds of thousands of publishers and advertisers that violate our policies each year – including ads containing malware, ads for counterfeit goods, or ads that attempt to misuse your personal information.

## How Google uses cookies in advertising

Cookies help to make advertising more effective. Without cookies, it's harder for an advertiser to reach its audience, or to know how many ads were shown and how many clicks they received.

Many websites, such as news sites and blogs, partner with Google to show ads to their visitors. Working with our partners, we may use cookies for a number of purposes, such as to stop you from seeing the same ad over and over again, to detect and stop click fraud, and to show ads that are likely to be more relevant (such as ads based on websites you have visited).

We store a record of the ads we serve in our logs. These server logs typically include your web request, IP address, browser type, browser language, the date and time of your request, and one or more cookies that may uniquely identify your browser. We store this data for a number of reasons, the most important of which are to improve our services and to maintain the security of our systems. We anonymize this log data by removing part of the IP address (after 9 months) and cookie information (after 18 months).

### Our advertising cookies

To help our partners manage their advertising and websites, we offer many products, including AdSense, AdWords, Google Analytics, and a range of DoubleClick-branded services. When you visit a page or see an ad that uses one of these products, either on Google services or on other sites and apps, various cookies may be sent to your browser.

These may be set from a few different domains, including google.com, doubleclick.net, googlesyndication.com, or googleadservices.com, or the domain of our partners' sites. Some of our advertising products enable our partners to use other services in conjunction with ours (like an ad measurement and reporting service), and these services may send their own cookies to your browser. These cookies will be set from their domains.

See more detail about the types of cookies used by Google and our partners and how we use them.

### How you can control advertising cookies

You can use Ads Settings to manage the Google ads you see and opt out of Ads Personalization. Even if you opt out of Ads Personalization, you may still see ads based on factors such as your general location derived from your IP address, your browser type, and your search terms.

You can also manage many companies' cookies used for online advertising via the consumer choice tools created under self-regulation programs in many countries, such as the US-based aboutads.info choices page or the EU-based Your Online Choices.

Finally, you can manage cookies in your web browser.

## Other technologies used in advertising

Google's advertising systems may use other technologies, including Flash and HTML5, for functions like display of interactive ad formats. We may use the IP address, for example, to identify your general location. We may also select advertising based on information about your computer or device, such as your device model, browser type, or sensors in your device like the accelerometer.

## Location

Google's ad products may receive or infer information about your location from a variety of sources. For example, we may use the IP address to identify your general location; we may receive precise location from your mobile device; we may infer your location from your search queries; and websites or apps that you use may send information about your location to us. Google uses location information in our ads products to infer demographic information, to improve the relevance of the ads you see, to measure ad performance and to report aggregate statistics to advertisers.

## Advertising identifiers for mobile apps

To serve ads in services where cookie technology may not be available (for example, in mobile applications), we may use technologies that perform similar functions to cookies. Sometimes Google links the identifier used for advertising on mobile applications to an advertising cookie on the same device in order to coordinate ads across your mobile apps and mobile browser. This can happen, for example, when you see an ad within an app that launches a web page in your mobile browser. This also helps us improve the reports we give to our advertisers on the effectiveness of their campaigns.

To opt out of personalized ads in apps on your mobile device, follow the instructions below.

## Android

1. Find Google Settings in one of these places (depending on your device):
   a. A separate app called **Google Settings**
   b. In your main **Settings** app, scroll down and tap **Google**
2. Tap **Ads**
3. Switch on **Opt out of interest-based ads**

## iOS

Devices with iOS use Apple's Advertising Identifier. To learn more about your choices for use of this identifier, visit the **Settings** app on your device.

## What determines the ads by Google that I see?

Many decisions are made to determine which ad you see.

Sometimes the ad you see is based on your current or past location. Your IP address is usually a good indication of your approximate location. So you might see an ad on the homepage of YouTube.com that promotes a forthcoming movie in your country, or a search for 'pizza' might return results for pizza places in your town.

Sometimes the ad you see is based on the context of a page. If you're looking at a page of gardening tips, you might see ads for gardening equipment.

Sometimes you might also see an ad on the web that's based on your app activity or activity on Google services; an in-app ad that's based on your web activity; or an ad based on your activity on another device.

Sometimes the ad you see on a page is served by Google but selected by another company. For example, you might have registered with a newspaper website. From information you've given the newspaper, it can make decisions about which ads to show you, and it can use Google's ad serving products to deliver those ads.

You may also see ads on Google products and services, including Search, Gmail, and YouTube, based on information, such as your email address, that you provided to advertisers and the advertisers then shared with Google.

**Why am I seeing ads by Google for products I've viewed?**

You may see ads for products you previously viewed. Let's suppose you visit a website that sells golf clubs, but you don't buy those clubs on your first visit. The website owner might want to encourage you to return and complete your purchase. Google offers services that let website operators target their ads to people who visited their pages.

For this to work, Google either reads a cookie that's already in your browser or places a cookie in your browser when you visit the golfing site (assuming your browser lets this happen).

When you visit another site that works with Google, which may have nothing to do with golfing, you might see an ad for those golf clubs. That's because your browser sends Google the same cookie. In turn, we may use that cookie to serve you an ad that could encourage you to buy those golf clubs.

Your visit to the golfing site may also be used by Google to show you personalized ads when you later search for golf clubs on Google.

We do have restrictions on this type of ad. For example, we prohibit advertisers from selecting an audience based on sensitive information, such as health information or religious beliefs.

Learn more about Google ads.

Our legal policies

Privacy Policy

Terms of Service

FAQ

## More information

Technologies and Principles

Advertising

How Google uses cookies

How Google uses pattern recognition

Types of location data used by Google

How Google Wallet uses credit card numbers

How Google Voice works

How Google uses data when you use our partners' sites or apps

## Additional resources

My Account

Google Safety Center

Google Product Privacy Guide

Your privacy, security, and controls

English

Google · About Google · Privacy · Terms

# Appendix A-8

Catch up on highlights from Firebase at Google I/O 2023. Learn more (https://firebase.blog/posts/2023/05/whats-new-at-google-io)

# Google Analytics

Google Analytics is an app measurement solution, available at no charge, that provides insight on app usage and user engagement.

At the heart of Firebase is Google Analytics, an unlimited analytics solution available at no charge. Analytics integrates across Firebase features and provides you with unlimited reporting for up to 500 distinct events that you can define using the Firebase SDK. Analytics reports help you understand clearly how your users behave, which enables you to make informed decisions regarding app marketing and performance optimizations.



Web setup (/docs/analytics/get-started?platform=web)

iOS+ setup (/docs/analytics/get-started?platform=ios)

Android setup (/docs/analytics/get-started?platform=android)

Flutter setup (/docs/analytics/get-started?platform=flutter)

C++ setup (/docs/analytics/cpp/start)    Unity setup (/docs/analytics/unity/start)

# Key capabilities

| | |
|---|---|
| Unlimited Reporting | Analytics provides unlimited reporting on up to 500 distinct events. |

| Audience Segmentation | Custom audiences can be defined in the Firebase console based on device data, custom events, or user properties. These audiences can be used with other Firebase features when targeting new features or notification messages. |
| --- | --- |

## How does it work?

Google Analytics helps you understand how people use your web, Apple, or Android app. The SDK automatically captures a number of events and user properties and also allows you to define your own custom events to measure the things that uniquely matter to your business. Once the data is captured, it's available in a dashboard through the Firebase console. This dashboard provides detailed insights about your data — from summary data such as active users and demographics, to more detailed data such as identifying your most purchased items.

Analytics also integrates with a number of other Firebase features. For example, it automatically logs events that correspond to notification messages sent via the Notifications composer and provides reporting on the impact of each campaign.

Analytics helps you understand how your users behave, so you can make informed decisions about how to market your app. See the performance of your campaigns across organic and paid channels to understand which methods are most effective at driving high-value users. If you need to perform custom analysis or join your data with other sources you can link your Analytics data to BigQuery, which allows for more complex analysis like querying large data sets and joining multiple data sources.

## Integrations with other services

| BigQuery | Link your Firebase app to BigQuery (https://support.google.com/firebase/answer/6318765) where you can |
| --- | --- |

Google Analytics for Firebase

| | perform custom analysis on your entire Analytics dataset and import other data sources. |
|---|---|
| Crashlytics | Analytics logs events for each crash so you can get a sense of the rate of crashes for different versions or regions, allowing you to gain insight into which users are impacted. You can also create audiences for users who have experienced multiple crashes and respond with notification messages directed at that audience. |
| FCM | Analytics automatically logs events that correspond to notification messages sent via the Notifications composer and supports reporting on the impact of each campaign. |
| Firebase Remote Config | Use Analytics audience definitions to change the behavior and appearance of your app for different audiences without distributing multiple versions of your app. |
| Google Tag Manager | Integrating Google Tag Manager (https://developers.google.com/tag-manager/) alongside Google Analytics enables you to manage your Analytics implementation remotely from a web interface after your app has been distributed. |

# Implementation path

**1**   Connect your app to Firebase    Getting started with Analytics is easy. Just add the Firebase SDK to your new or existing app, and data collection begins automatically.

You can view analytics data in the Firebase console within hours.

| | | |
|---|---|---|
| 2 | Log custom data | You can use Analytics to log custom events that make sense for your app, like E-Commerce purchases or achievements. |
| 3 | Create audiences | You can define the audiences that matter to you in the Firebase console. |
| 4 | Target audiences | Use your custom audiences to target messages, promotions, or new app features using other Firebase features, such as FCM, and Remote Config. |

# Next steps

- Add Google Analytics to your web (/docs/analytics/get-started?platform=web), Apple (/docs/analytics/get-started?platform=ios), Android (/docs/analytics/get-started?platform=android), or Flutter (/docs/analytics/get-started?platform=flutter) app.

- Download sample code (/docs/samples).

# Appendix A-9

# [GA4] Automatically collected events

Automatically collected events are triggered by basic interactions with your app and/or site (as indicated under the event name in the table below). As long as you use the Google Analytics for Firebase SDK or gtag.js, you don't need to write any additional code to collect these events.

Analytics collects events for Android *and* iOS apps unless otherwise stated. The names and parameters of these events can be helpful when accessing your raw event data in BigQuery.

> **Note**
>
> The following parameters are collected by default with every event, including custom events. The automatically collected events that don't have parameters listed in the table below only receive the following parameters:
>
> - *language*
> - *page_location*
> - *page_referrer*
> - *page_title*
> - *screen_resolution*
>
> The value assigned to event parameters must be 100 characters or fewer. The *page_title* parameter must be 300 characters or fewer. The *page_referrer* parameter must be 420 characters or fewer. The *page_location* parameter must be 1,000 characters or fewer.
>
> If you override the *page_location* parameter, make sure that the URL path is valid. If you assign an invalid URL path, the *Page location* dimension will be empty. You can use the Campaign URL Builder to check whether a URL path is valid.

| Event | Automatically triggered... | Parameters |
|---|---|---|
| ad_click (app) | when a user clicks an ad <br><br> Publisher events coming from AdMob via the Google Mobile Ads SDK or Ad Manager via the Ad Manager integration <br><br> This event is not exported to BigQuery. | ad_event_id |
| ad_exposure (app) | when at least one ad served by the Mobile Ads SDK is on screen <br><br> This event does not appear in reports and is not exported to BigQuery. | firebase_screen, firebase_screen_id, firebase_screen_class, exposure_time |
| ad_impression (app) | when a user sees an ad impression <br><br> Publisher events coming from AdMob via the Google Mobile Ads SDK or Ad Manager via the Ad Manager integration <br><br> This event is not exported to BigQuery. | ad_event_id, value* |
| ad_query (app) | when an ad request is made by the Mobile Ads SDK <br><br> This event does not appear in reports and is not exported to BigQuery. | ad_event_id |
| ad_reward (app) | when a reward is granted by a rewarded ad served by the Mobile Ads SDK | ad_unit_code, reward_type, reward_value |

| adunit_exposure (app) | when an ad unit served by the Mobile Ads SDK is on screen<br><br>This event does not appear in reports and is not exported to BigQuery. | firebase_screen, firebase_screen_id, firebase_screen_class, exposure_time |
|---|---|---|
| app_clear_data (app) | when the user resets/clears the app data, removing all settings and sign-in data<br><br>Android only | |
| app_exception (app) | when the app crashes or throws an exception<br><br>The event is sent when you integrate Firebase Crashlytics. | fatal, timestamp, engagement_time_msec |
| app_remove (app) | when an application package is removed (uninstalled) from an Android device<br><br>Android only<br><br>This event is different from the *Daily uninstalls by device* and *Daily uninstalls by user* metrics, which are both reported by Google Play Developer Console ☑ . The *app_remove* event counts the removal of application packages, regardless of the installation source, and the count changes depending on the date range you are using for the report. The *Daily uninstalls by device* and *Daily uninstalls by user* metrics count the removal of application packages only when they were installed from Google Play, and are reported on a daily basis. | |
| app_store_refund (app) | when an in-app purchase is refunded by Google Play<br><br>Android only<br><br>This event is not exported to BigQuery. | product_id, value, currency, quantity |
| app_store_ subscription_cancel (app) | when a paid subscription is cancelled in Google Play<br><br>Android only<br><br>Requires an initial subscription that was made on or after July 1, 2019.<br><br>This event is not exported to BigQuery. | product_id, price, value, currency, cancellation_reason |
| app_store_ subscription_convert (app) | when a free-trial subscription is converted to a paid subscription<br><br>This event is set as a default conversion.<br><br>Requires an initial subscription that was made on or after July 1, 2019. An initial free-trial subscription is logged as an in_app_purchase with the subscription parameter set to true.<br><br>This event is not exported to BigQuery. | product_id, price, value, currency, quantity |
| app_store_ subscription_renew | when a paid subscription is renewed<br><br>This event is set as a default conversion. | product_id, price, value, currency, quantity, renewal_count |

| | | |
|---|---|---|
| (app) | Requires an initial subscription that was made on or after July 1, 2019.<br><br>This event is not exported to BigQuery. | |
| app_update<br><br>(app) | when the app is updated to a new version and launched again<br><br>The previous app version id is passed as a parameter.<br><br>This event is conceptually different from the Daily upgrades by device metric, which is reported by Google Play Developer Console ⧉ . An upgrade refers to the updating of the application binary, whereas an app_update event is triggered upon the subsequent launch of the upgraded app. | previous_app_version |
| click<br><br>(web) | each time a user clicks a link that leads away from the current domain<br><br>By default, outbound click events will occur for all links leading away from the current domain. Links to domains configured for cross-domain measurement will not trigger outbound click events.<br><br>The parameters populate the following dimensions:<br><br>• *Link classes* (from link_classes)<br>• *Link domain* (from link_domain)<br>• *Link ID* (from link_id)<br>• *Link URL* (from link_url)<br>• *Outbound* (from outbound)<br><br>Collected by default via enhanced measurement. | link_classes, link_domain, link_id, link_url, outbound (boolean) |
| dynamic_link_app_open<br><br>(app) | when a user re-opens the app via a dynamic link<br><br>**Note**: This event is being phased out as Firebase Dynamic Links is currently deprecated. Learn more about these changes. | source, medium, campaign, link_id, accept_time |
| dynamic_link_<br><br>app_update<br><br>(app) | when the app is updated to a new version and is opened via a dynamic link<br><br>Android only<br><br>**Note**: This event is being phased out as Firebase Dynamic Links is currently deprecated. Learn more about these changes. | source, medium, campaign, link_id, accept_time |
| dynamic_link_<br><br>first_open<br><br>(app) | when a user opens the app for the first time via a dynamic link<br><br>**Note**: This event is being phased out as Firebase Dynamic Links is currently deprecated. Learn more about these changes. | source, medium, campaign, link_id, accept_time |
| error<br><br>(app) | logged in place of an event that can't be logged because it is invalid in some way<br><br>_err (firebase_error), _ev (firebase_error_value), and _el (firebase_error_length) parameters have additional information. | firebase_error, firebase_error_value |

| | This event does not appear in reports and is not exported to BigQuery. | |
|---|---|---|
| file_download<br><br>(web) | when a user clicks a link leading to a file (with a common file extension) of the following types:<br>• document<br>• text<br>• executable<br>• presentation<br>• compressed file<br>• video<br>• audio<br><br>This event is collected by default via enhanced measurement. See the file extensions that trigger the event | file_extension, file_name link_classes, link_id, link_text, link_url |
| firebase_campaign<br><br>(app) | when the app is launched with campaign parameters<br><br>This event does not appear in reports and is not exported to BigQuery. | source, medium, campaign, term, content, gclid, aclid, cp1, anid, click_timestamp, campaign_info_source |
| firebase_in_app_<br>message_action<br><br>(app) | when a user takes action on a Firebase In-App Message | message_name, message_device_time, message_id |
| firebase_in_app_<br>message_dismiss<br><br>(app) | when a user dismisses a Firebase In-App Message | message_name, message_device_time, message_id |
| firebase_in_app_<br>message_impression<br><br>(app) | when a user sees a Firebase In-App Message | message_name, message_device_time, message_id |
| first_open<br><br>(app) | the first time a user launches an app after installing or re-installing it<br><br>This event is not triggered when a user downloads the app onto a device, but instead when he or she first uses it. To see raw download numbers, look in Google Play Developer Console or in iTunesConnect.<br><br>Supports measuring first_open conversions for users who accept Apple's iOS 14 app-tracking prompt. | previous_gmp_app_id, updated_with_analytics, previous_first_open_count, system_app, system_app_update, deferred_analytics_collection, reset_analytics_cause, engagement_time_msec |
| first_visit<br><br>(app, web) | the first time a user visits a website or launches an Android instant app with Analytics enabled | |
| form_start<br><br>(web) | the first time a user interacts with a form in a session<br><br>Note: You can only use the parameters in your reports if you create custom dimensions for them.<br><br>Collected by default via enhanced measurement. | form_id, form_name, form_destination |

| form_submit<br><br>(web) | when the user submits a form<br><br>Note: You can only use the parameters in your reports if you create custom dimensions for them.<br><br>Collected by default via enhanced measurement. | form_id, form_name, form_destination, form_submit_text |
|---|---|---|
| in_app_purchase<br><br>(app) | when a user completes an in-app purchase, including an initial subscription, that is processed by the Apple App Store or Google Play Store<br><br>The product ID, product name, currency, and quantity are passed as parameters.<br><br>This event is triggered only by versions of your app that include the Google Analytics for Firebase SDK.<br><br>**Android:**<br><br>To see in-app purchase data for Android apps, link Analytics to Google Play.<br><br>Note that Analytics doesn't automatically measure paid-app purchase revenue. Also, your reported revenue in Google Analytics may differ from the values you see in the Google Play Developer Console.<br><br>Analytics ignores events that are flagged as invalid or tests. Learn more about testing Google Play billing.<br><br>**iOS:**<br><br>Note that Analytics doesn't automatically measure paid-app purchase revenue and refunds.<br><br>Analytics ignores events that are flagged as invalid or sandbox. | product_id, price, value, currency, quantity, subscription, free_trial, introductory_price |
| notification_dismiss<br><br>(app) | when a user dismisses a notification sent by Firebase Cloud Messaging (FCM)<br><br>Android only | message_name, message_time, message_device_time, message_id, topic, label, message_channel |
| notification_foreground<br><br>(app) | when a notification sent by FCM is received while the app is in the foreground | message_name, message_time, message_device_time, message_id, topic, label, message_channel, message_type |
| notification_open<br><br>(app) | when a user opens a notification sent by FCM | message_name, message_time, message_device_time, message_id, topic, label, message_channel |
| notification_receive<br><br>(app) | when a notification sent by FCM is received by a device when the app is in the background<br><br>Android only | message_name, message_time, message_device_time, message_id, topic, label, message_channel, message_type |
| os_update | when the device operating system is updated to a new version. The previous operating system version id is passed as a parameter | previous_os_version |

[GA4] Automatically collected events - Firebase Help

| | | |
|---|---|---|
| (app) | | |
| page_view<br><br>(web) | each time the page loads or the browser history state is changed by the active site<br><br>Collected by default via enhanced measurement. | page_location (page URL), page_referrer (previous page URL), engagement_time_msec |
| screen_view<br><br>(app) | when a screen transition occurs and any of the following criteria are met:<br>• No screen was previously set<br>• The new screen name differs from the previous screen name<br>• The new screen-class name differs from the previous screen-class name<br>• The new screen id differs from the previous screen id | firebase_screen, firebase_screen_class, firebase_screen_id, firebase_previous_screen, firebase_previous_class, firebase_previous_id, engagement_time_msec |
| scroll<br><br>(web) | the first time a user reaches the bottom of each page (i.e., when a 90% vertical depth becomes visible)<br><br>Collected by default via enhanced measurement. | engagement_time_msec |
| session_start<br><br>(app, web) | when a user engages the app or website<br><br>A session ID and session number are generated automatically with each session and associated with each event in the session. Learn more | |
| user_engagement<br><br>(app, web) | when the app is in the foreground or webpage is in focus for at least one second. Learn more | engagement_time_msec |
| video_complete<br><br>(web) | when the video ends<br><br>For embedded YouTube videos that have JS API support enabled.<br><br>Collected by default via enhanced measurement. | video_current_time, video_duration, video_percent, video_provider, video_title, video_url, visible (boolean) |
| video_progress<br><br>(web) | when the video progresses past 10%, 25%, 50%, and 75% duration time<br><br>For embedded YouTube videos that have JS API support enabled.<br><br>Collected by default via enhanced measurement. | video_current_time, video_duration, video_percent, video_provider, video_title, video_url, visible (boolean) |
| video_start<br><br>(web) | when the video starts playing<br><br>For embedded YouTube videos that have JS API support enabled.<br><br>Collected by default via enhanced measurement. | video_current_time, video_duration, video_percent, video_provider, video_title, video_url, visible (boolean) |
| view_search_results<br><br>(web) | each time a user performs a site search, indicated by the presence of a URL query parameter<br><br>Collected by default via enhanced measurement. | search_term, optionally 'q_<additional key="">' (where <additional key=""> matches an additional query parameter you specify to be collected under advanced settings)<br><br>Note: This event only sends the unique_search_term |

| | | parameter when it has a value of 1 (i.e. when the string is unique to that session). |
| --- | --- | --- |

**Note:** File extensions that match the following regex will trigger the file_download event:

pdf|xlsx?|docx?|txt|rtf|csv|exe|key|pp(s|t|tx)|7z|pkg|rar|gz|zip|avi|mov|mp4|mpe?g|wmv|midi?|mp3|wav|wma

<mark>* no_ad_impression value or currency is passed with the default integration</mark>

# Appendix A-10

## Google

# GEO Privacy Champion

Key Privacy Concepts

Privileged & Confidential
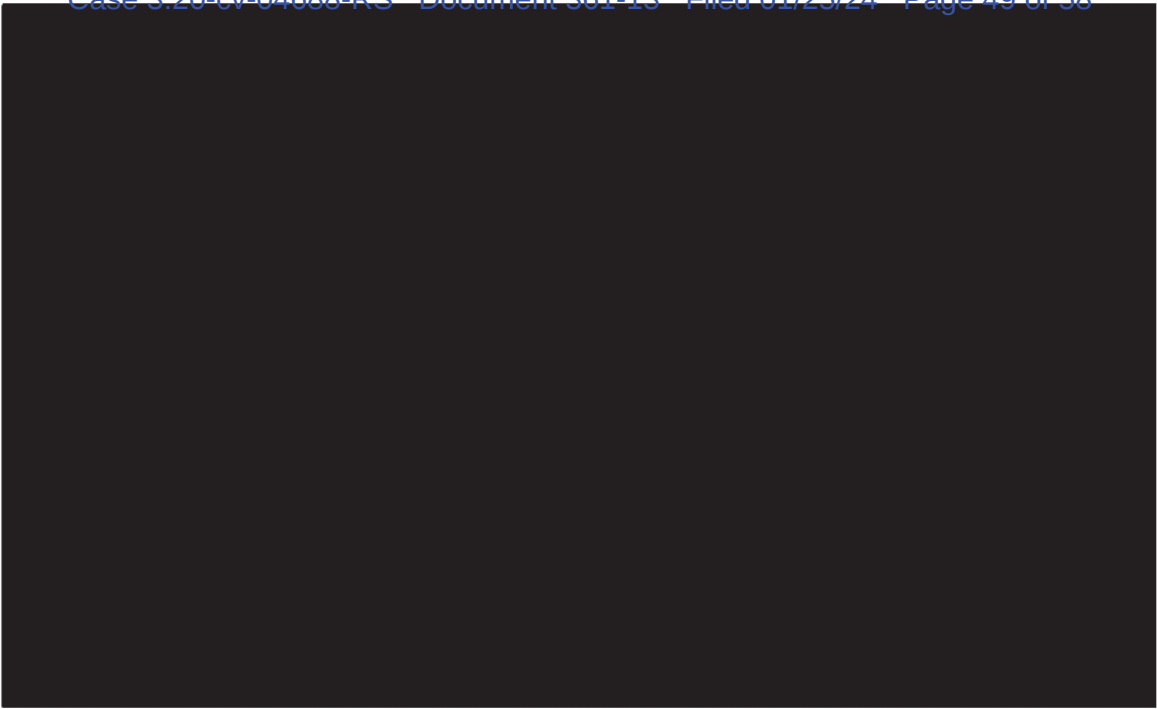
# Appendix A-11

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    mram@forthepeople.com

18
19                  **UNITED STATES DISTRICT COURT**
                  **NORTHERN DISTRICT OF CALIFORNIA**

20  ANIBAL RODRIGUEZ, SAL CATALDO,          Case No.:  3:20-cv-04688-RS
21  JULIAN SANTIAGO, and SUSAN LYNN
    HARVEY individually and on behalf of all
22  other similarly situated,               **DECLARATION OF JONATHAN**
                                            **HOCHMAN IN SUPPORT OF**
                                            **PLAINTIFFS' MOTION FOR CLASS**
23          Plaintiffs,                     **CERTIFICATION**
24      v.
                                            Judge: Hon. Richard Seeborg
25  GOOGLE LLC,                             Courtroom 3 – 17th Floor
                                            Date: October 5, 2023
26          Defendant.                      Time: 1:30 p.m.
27
28

**DECLARATION OF JONATHAN HOCHMAN**

I, Jonathan Hochman, declare as follows.

1.      Counsel for the *Rodriguez* Plaintiffs retained me to provide expert analysis and, if requested, expert testimony. I have personal knowledge of the matters set forth herein and am competent to testify.

2.      I submit this declaration in connection with Plaintiffs' Motion for Class Certification.

3.      Attached is a true and correct copy of the Expert Report that I prepared in connection with this matter, dated March 22, 2023. The opinions I provided therein are true and correct to the best of my knowledge.


I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.  Executed this 17th day of July, 2023, at New London, CT

*/s/ Jonathan E. Hochman*

## IN THE UNITED STATES DISTRICT COURT

### FOR THE NORTHERN DISTRICT
### OF CALIFORNIA

|  |  |  |
|---|---|---|
| | § | |
| | § | |
| | § | |
| **ANIBAL RODRIGUEZ, SAL CATALDO,** | § | |
| **JULIAN SANTIAGO, and SUSAN LYNN** | § | |
| **HARVEY, individually and on behalf of** | § | |
| **all other similarly situated,** | § | |
| | § | |
| *Plaintiffs,* | § | **Case No. 3:20-cv-04688-RS** |
| v. | § | |
| | § | |
| **GOOGLE LLC,** | § | |
| | § | |
| *Defendant.* | § | |
| | § | |
| | § | |
| | § | |
| | § | |
| | § | |

### EXPERT REPORT OF JONATHAN E. HOCHMAN

**March 22, 2023**

Google" because, among other things, it "[b]oosts downstream business opportunities," in "Ads, Play, Cloud and more" (GOOG-RDGZ-00056947 at -956).[44]

62.      As mentioned above, one of the products in the Firebase suite is an analytics product, which was initially released as Firebase Analytics and was rebranded as Google Analytics for Firebase (GA4F) in May 2017 (GOOG-RDGZ-00059723 at -723; GOOG-RDGZ-00057998 at -999; Ganem Tr. 18:11-15, 106:12-14). GA4F is an app measurement tool, which collects data relating to user activity on apps. To use GA4F, app developers must embed the Firebase SDK code into their apps. Google internally refers to its app measurement efforts, including GA4F, by the codename "Scion."[45] GA4F adoption is important to Google, as it allows Google to collect and save "high-fidelity signals to power Ads ML [machine learning]" technology (GOOG-RDGZ-00177709 at -711). GA4F "is the most-used analytics SDK on Android, in use by over 1.2M apps, including many large 3P [non-Google owned] and 1P [Google owned] apps" (GOOG-RDGZ-00050615 at -615).

63.      For app developers who use Firebase, GA4F is enabled by default (GOOG-RDGZ-00092368 at -372). Google recognizes that "full functionality across the services *requires* our analytics to be on" (GOOG-RDGZ-00092368 at -372). GA4F "is tightly integrated with Ads," and "shares a developer's analytics data to enhance our advertising services" by default (GOOG-RDGZ-00092368 at -372).

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[44] Google ads refers to Google's advertising business, including serving advertisements in mobile apps as well as ad performance tracking. Google derives most of its hundreds of billions of annual revenue from its advertising business. *Form 10-K*, https://www.sec.gov/Archives/edgar/data/1652044/000165204422000019/goog-20211231.htm (Last accessed March 17, 2013). Google Play refers to Google's Play App Store through which users can download and install apps on Android devices. Google charges developers a service fee as a percentage of their earnings related to app purchases. *Play Console Help*, Google, https://support.google.com/googleplay/android-developer/answer/11131145?hl=en (Last accessed March 17, 2023). Google Cloud offers hosting, data storage and data analysis services with a pay-as-you-go fee structure. *Google Cloud*, Google, https://cloud.google.com (Last accessed March 17, 2023).
[45] GOOG-RDGZ-00051774 at -776; Ganem Tr. 106:9-11 ("Scion is an internal code name that is associated with our app measurement efforts in Google Analytics.").

83.    I will use the term "sWAA-off data" to refer to data generated during a user's interaction with a non-Google mobile app while that user is signed into a Google account and her sWAA toggle was set to "off" (or equivalently "paused" or "disabled"). Note that sWAA-off data necessarily encompasses WAA-off data because sWAA cannot be turned on when WAA is turned off. However, a user can turn on WAA while turning off sWAA.

84.    Google has collected WAA-off and sWAA-off data by way of Google Analytics for Firebase, app advertising products (i.e., AdMob and Ad Manager), and Firebase Cloud Messaging.

### 1.    Google Analytics for Firebase

85.    Irrespective of whether WAA or sWAA is set to on or off, Google has collected user data through Google Analytics for Firebase throughout the class period and across class members. Notwithstanding its public representations, Google admitted in this litigation that "WAA has never controlled whether Google Analytics for Firebase collects and sends user activity data from third party apps to Google servers" (Google's Supp. Resp. to Interrog. No. 4). WAA "functions independently from Google Analytics for Firebase," and therefore "turning off Web & App Activity does not prevent" Google from collecting data by way of Google Analytics for Firebase (Google's Resp. to RFA No. 1). Google processes user data "regardless of whether [they] have WAA on or off" (Google's Resp. to RFA No. 20).

86.    My opinion is further supported by David Monsees[72] and Steve Ganem's deposition testimony that Google checks the user's WAA and sWAA status on its own servers, rather than the user's device.[73] That means that Google must collect and save data regardless of a user's WAA

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[72] Mr. Monsees has been a Google employee since 2009 and is currently the product manager for Footprints (Monsees Tr. 18:21-22, 23:25-24:1).
[73] When questioned why Google Analytics would not check a local cache setting, like App Indexing, before uploading to Google servers, Mr. Monsees responded that "different services like Google Analytics might have other bases to process that data." Mr. Monsees further stated that he was not aware of any document that could explain "the logic behind the differences as to why some products with sWAA controls would check locally versus

and sWAA settings. Only after Google collects and saves app activity data does Google check the

user's WAA and sWAA settings (Monsees Tr. 96:1-13), and even then Google saves WAA-off

and sWAA-off data.[74] Google could have designed GA4F and the GMA SDK to check the user's

WAA and sWAA settings on the device. Google's App Indexing product, for example, checks the

user's device for the sWAA setting and does not send data to Google's servers if sWAA is off

(Monsees Tr. 215:13-18, 303:4-10). Google chose not to design GA4F and the GMA SDK this

way.

87.    In the rest of this subsection, I explain the types of data and identifiers collected by Google

Analytics for Firebase. As I discussed, WAA and sWAA settings have no impact on the types of

data collected by Google app analytics products, including because a user's WAA and sWAA

settings are not checked until data reaches Google servers. Even then, Google systematically saves

and uses WAA-off and sWAA-off data for its own benefit. The data that Google collects and saves

is essentially unaffected by the user's WAA and sWAA settings, except when sWAA is off,

Google saves data only with persistent Google identifiers other than GAIA. In effect, the controls

are a placebo. The user is given the choice whether they want to see some of the data Google

collects and saves, or if the user would prefer to remain blissfully ignorant that Google is spying

on their most private moments as they interact with their mobile devices.

88.    Google Analytics for Firebase (GA4F) is a key component of Firebase and is included with

the Firebase SDK implementation (GOOG-RDGZ-00187017 at -018). Documents that Google

produced in this litigation confirm that GA4F provides "[c]omprehensive event-centric in-App

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not check locally before uploading the data to Google servers," and that these decisions were "per service basis"
(Monsees Tr. 216:24-218:1); *see also* Ganem Tr. 113:10-11.
[74] ████████████████████████████████████████████████████████████████████
████████████████████████████████████████████████████████████████████████
████████████████████████████████████████████ (Monsees Tr. 310:8-20).

'behavioral' analytics" and an "[a]cross-network attribution tool" (GOOG-RDGZ-00187017 at -018).

89.    Among other things, GA4F collects data about events, parameters, and user properties. Events are activities that users perform on an app, such as opening the app for the first time (a "first open"), loading a new page (a "screen view"), selecting content on a page ("select_content"), or making an in-app purchase (Answer ¶ 51). Google collects additional information about these events, and each piece of additional information is a "parameter." For example, when a user makes an in-app purchase, GA4F also collects an identifier for the product, as well as its price, currency, and quantity.[75] When a user loads a new page, GA4F also collects information about the identity of the page (page_title), the length of time the user spends on that page (engagement_time_msec), as well as information about the last page the user was on.[76] GA4F also collects "user properties," which are data about users themselves, as opposed to their activity (GOOG-RDGZ-00187017 at -018). User properties include age, gender, interests, operating system, location, language, and potentially even "favorite food."[77] While Google describes the collected events, parameters, and user properties to developers in online developer support pages, nowhere does Google disclose that it collects this data even if the user's WAA or sWAA setting is turned off.

90.    Through GA4F, Google collects information about a "core set" of events, automatically and "[o]ut-of-the box" (GOOG-RDGZ-00187017 at -018). These events include "installs ('first opens')", "in-app purchases," operating system updates ("os_update"), the start of a session of app activity ("session_start"), and user engagement with the app ("user_engagement") (GOOG-

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[75] *[GA4] Automatically Collected Events*, Google Analytics Help,
https://support.google.com/analytics/answer/9234069?hl=en (Last accessed March 13, 2023).
[76] *[GA4] Automatically Collected Events*, Google Analytics Help,
https://support.google.com/analytics/answer/9234069?hl=en (Last accessed March 13, 2023).
[77] *[GA4] User Properties*, Google Analytics Help, https://support.google.com/analytics/answer/9355671?hl=en
(Last accessed March 13, 2023).

RDGZ-00187017 at -018; GOOG-RDGZ-00195309 at -490). GA4F includes "10+ automatically

captured events" (GOOG-RDGZ-00187017 at -018). Indeed, Google acknowledges that "there are

at least 26 events that can be collected through GA for Firebase automatically" (Answer ¶ 52).

91.    Through GA4F, Google also collects a set of parameters automatically.[78] Each

automatically collected event has a set of automatically collected parameters. These include, for

example,      "firebase_screen",      "firebase_screen_class",      "firebase_screen_id",

"firebase_previous_screen",      "firebase_previous_class",      "firebase_previous_id",      and

"engagement_time_msec" for the "screen_view" event. Other events automatically collect

parameters such as title of the page ("page_title"), data associated with the URL of the page

("page_location"), screen information (including "screen_resolution"), and session information.[79]

Through GA4F, Google collects the mobile equivalents of a webpage URL and "referrer,"[80] which

tells Google exactly which screen the user is viewing in the application. Google also uses GA4F

to automatically collect other parameters only for specific events. For example, GA4F

automatically collects price and value information associated with in-app purchases, but it does

not collect this information when the user simply opens the app.[81] Through GA4F, Google

"track[s] metrics such as user engagement or user behavior per screen."[82]

[78] *[GA4] Automatically Collected Events*, Google Analytics Help,
https://support.google.com/analytics/answer/9234069?hl=en (Last accessed March 13, 2023).
[79] *[GA4] Automatically Collected Events*, Google Analytics Help,
https://support.google.com/analytics/answer/9234069?hl=en (Last accessed March 13, 2023); Answer ¶ 54-56;
Google's Resp. to Interrog. No. 1.
[80] In the 1990s computer scientist Phillip Hallam-Baker mis-spelled "referrer" as "referer" in a HTTP standards
document, RFC 1945, and it stuck. *See HTTP Referer*, Wikipedia, https://en.wikipedia.org/wiki/HTTP_referer (Last
accessed March 17, 2023).
[81] *[GA4] Automatically Collected Events*, Google Analytics Help,
https://support.google.com/analytics/answer/9234069?hl=en (Last accessed March 13, 2023).
[82] *Measure Screenviews*, Gooogle,
https://firebase.google.com/docs/analytics/screenviews#automatically_track_screens (Last accessed February 15,
2023).

92.     Many of the events that Google automatically logs with GA4F, such as first opens and in-app purchases, are common conversion events. Conversion events are user activities that are considered important, and that developers and advertisers often seek to optimize. As explained by Belinda Langner, Google's 30(b)(6) designee and Product Manager for App Campaigns, "in the context of advertising" a conversion occurs when "a specific ad led to a specific action within the app," such as a "first open or [an] in-app purchase" (Langner Tr. 133:13-18; *see also* Ma Tr. 213:8-11).[83] Through GA4F, Google collects data that Google uses to track conversions driven by advertisers that place their ads with Google, and that Google serves through platforms like AdMob (Ganem Tr. 28:21-25).

93.     Through GA4F, Google also automatically collects certain user properties. These include age, gender, interests, app version, operating system version, language, first launch time, and device model, and many other pieces of information (GOOG-RDGZ-00187017 at -018; Google's Resp. to Interrog. No. 1).

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[83] *See also* Langner Tr. 133:20-23 ("advertisers are able to define their -- the app events that they care about, and so certainly, advertisers define other types of events").

94.    Some of the events and user properties that GA4F automatically collects are shown in the

figure below, which is excerpted from a 2016 document (GOOG-RDGZ-00195309 at -490).[84]



95.    Altogether, GA4F collects a surprising amount of data. According to documents Google

produced in this case, GA4F can collect "up to *500* different event types," with "*25* parameters per

event," while simultaneously collecting detailed data about the user "such as Age, Gender,

Interests, App Version, and OS Version" and potentially dozens more pieces of information

(GOOG-RDGZ-00187017 at -018). GA4F can also "create up to 50 audiences by combining event

data and user properties," and track specific events designated as "conversions" (GOOG-RDGZ-

00187017 at -018).

96.    GA4F can be integrated with many other Google products, including Google AdMob,

Google Play[85], Google Ads, Firebase Cloud Messaging, and Firebase Crashlytics (GOOG-RDGZ-

00050615 at -615). "Google Analytics has integrations with other products which may collect their

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[84] *See also* GOOG-RDGZ-00028218 at -219 and -220. The document lists some of the automatically captured events by GA4F, including first_open, in_app_purchase, error, user_engagement, session_start, app_update, os_update, app_clear_data, notification_foreground, notification_receive, notification_open, notification_dismiss. Some of the automatic user properties collected include app version, device model, interests, gender, age, OS version, app store, first open date and new/established. In addition to automatically logged events, GA4F can also log recommended events and custom events specified by app developers. *Log Events*, Google, https://firebase.google.com/docs/analytics/events?platform=android (Last accessed February 15, 2023).
[85] In Google's Answer to Plaintiff's Fourth Amended Complaint, "Google admits that Firebase SDK provides support for Google Play and that Google Play is a platform through which app developers can distribute their app to users and process payments" (Answer ¶ 41).

own data separately and log them to different log sources and where there are integrations between these products, it may be that certain data from one product then later flows into another product, which is the nature of integrations" (Ganem Tr. 53:7-14).

97.    As I discussed above, Google uses GA4F to collect and save data relating to user activity within apps, either natively or within Webview. The events, parameters, and user properties that Google uses GA4F to collect and save in Webview are also extensive.

98.    A Google help page summarizes the events that Google automatically collects and saves using GA4, which, as I explained previously, is the current generation of Google Analytics for apps and the web, built atop the GA4F architecture. These events are identified in the table below, and events denoted "web" are applicable in Webview[86]:

| Event | Automatically triggered… |
|---|---|
| ad_click | when a user clicks an ad |
| ad_exposure | when at least one ad served by the Mobile Ads SDK is on screen |
| ad_impression | when a user sees an ad impression |
| ad_query | when an ad request is made by the Mobile Ads SDK |
| ad_reward | when a reward is granted by a rewarded ad served by the Mobile Ads SDK |
| adunit_exposure | when an ad unit served by the Mobile Ads SDK is on screen |
| app_clear_data | when the user resets/clears the app data, removing all settings and sign-in data<br>Android only |
| app_exception | when the app crashes or throws an exception |
| app_remove | when an application package is removed (uninstalled) from an Android device<br>Android only |
| app_store_refund | when an in-app purchase is refunded by Google Play<br>Android only |
| app_store_subscription_cancel | when a paid subscription is cancelled in Google Play<br>Android only |
| app_store_subscription_convert | when a free-trial subscription is converted to a paid subscription |
| app_store_subscription_renew | when a paid subscription is renewed |
| app_update | when the app is updated to a new version and launched again |
| click (web) | each time a user clicks a link that leads away from the current domain |
| dynamic_link_app_open | when the app is updated to a new version and is opened via a dynamic link<br>Android only |
| dynamic_link_app_update | when the app is updated to a new version and is opened via a dynamic link<br>Android only |

[86] *[GA4] Automatically Collected Events*, Firebase Help, https://support.google.com/firebase/answer/9234069 (Last accessed February 15, 2023).

| Event | Automatically triggered… |
|---|---|
| dynamic_link_first_open | when a user opens the app for the first time via a dynamic link |
| error | logged in place of an event that can't be logged because it is invalid in some way |
| file_download (web) | when a user clicks a link leading to a file |
| firebase_campaign | when the app is launched with campaign parameters |
| firebase_in_app_message_action | when a user takes action on a Firebase In-App Message |
| firebase_in_app_message_dismiss | when a user dismisses a Firebase In-App Message |
| firebase_in_app_message_impression | when a user sees a Firebase In-App Message |
| first_open | the first time a user launches an app after installing or re-installing it |
| first_visit | the first time a user visits a website or launches an Android instant app with Analytics enabled |
| form_start (web) | the first time a user interacts with a form in a session |
| form_submit (web) | when the user submits a form |
| in_app_purchase | when a user completes an in-app purchase, including an initial subscription, that is processed by the Apple App Store or Google Play Store |
| notification_dismiss | when a user dismisses a notification sent by Firebase Cloud Messaging (FCM)<br>Android only |
| notification_foreground | when a notification sent by FCM is received while the app is in the foreground |
| notification_open | when a user opens a notification sent by FCM |
| notification_receive | when a notification sent by FCM is received by a device when the app is in the background<br>Android only |
| notification_send | when a notification is sent by FCM<br>Android only |
| os_update | when the device operating system is updated to a new version. |
| page_view (web) | each time the page loads or the browser history state is changed by the active site |
| screen_view | when a screen transition occurs |
| scroll (web) | the first time a user reaches the bottom of each page (i.e., when a 90% vertical depth becomes visible) |
| session_start | when a user engages the app or website |
| user_engagement | when the app is in the foreground or webpage is in focus for at least one second. |
| video_complete (web) | when the video ends |
| video_progress (web) | when the video progresses past 10%, 25%, 50%, and 75% duration time |
| video_start (web) | when the video starts playing |
| view_search_results (web) | each time a user performs a site search, indicated by the presence of a URL query parameter |

99.     With GA4F, Google also collects and saves user dimensions relating to users in native app and Webview, including sensitive user information such as age, gender, location, interests,

location, and device information. Automatically collected user dimensions are summarized in the

table below, also based on a Google help page[87]:

| User dimension | Description |
|---|---|
| Age | The age of the user by bracket: 18-24, 25-34, 35-44, 45-54, 55-64, and 65+. |
| App store | The store from which the app was downloaded and installed. |
| App version | The versionName (Android) or the Bundle version (iOS). |
| Browser (web) | The browser from which user activity originated. |
| City | The city from which user activity originated. |
| Continent | The continent from which user activity originated. |
| Country | The country from which user activity originated. |
| Device brand | The brand name of the mobile device (such as Motorola, LG, or Samsung). |
| Device category | The category of the mobile device (such as mobile or tablet). |
| Device model | The mobile device model name (such as iPhone 5s or SM-J500M). |
| Gender | The gender of the user (male or female). |
| Interests | The interests of the user (such as Arts & Entertainment, Games, Sports). |
| Language | The language setting of the device OS (such as en-us or pt-br). |
| New/Established | New: First opened the app within the last 7 days.<br>Established: First opened the app more than 7 days ago. |
| Operating system | The operating system used by visitors to your website or mobile app. |
| OS version | The operating system version used by visitors to your website or mobile app (such as 9.3.2 or 5.1.1). |
| Platform | The platform on which your website or mobile app ran (such as web, iOS, or Android). |
| Region | The geographic region from which user activity originated. |
| Subcontinent | The subcontinent from which user activity originated. |

a.    Identifiers Used and Issued by Google

100.    Google uses GA4F to collect and save a multitude of identifiers for specific events, apps,

devices, and users, in addition to events and user properties.

101.    One of the identifiers that Google collects and saves via GA4F is the GAIA ID, which is

unique to the user's Google account. Google collects the user's GAIA ID regardless of their WAA

or sWAA status; the user's WAA or sWAA status affects the locations and time for which data is

saved alongside the GAIA ID. When the user has turned off WAA or sWAA, their data may still

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[87] *[GA4] Predefined User Dimensions*, Firebase Help, https://support.google.com/firebase/answer/9268042 (Last accessed February 15, 2023).

119.     Based on documents that Google produced in this case, the testimony of Google's employees and Google itself (including through interrogatory responses and Google's 30(b)(6) designees), and my testing of Google's collection and saving of data related to apps that use these Google advertising products, it is my opinion that Google uses these app advertising products to collect and save app activity data even if the user has turned off their WAA or sWAA settings.

120.     As with GA4F, Google checks the user's consent status on its servers, after collecting and saving the data. David Monsees, Google's 30(b)(6) designee and Product Manager in the Footprints team, explained that Google first collects and saves an ad request without knowing "if WAA was on or not" (Monsees Tr. 96:1-13). Google checks the user's WAA and sWAA status only after the ad request "hits the Google server" (Monsees Tr. 96:1-13). Google's internal documentation describing the "[l]ife of an ad request" confirms Mr. Monsees's understanding (GOOG-RDGZ-00028472 at -474). According to that document, a Google server called ▇▇▇▇ "[h]andles all policy enforcement details" (i.e., works with other servers to check WAA and sWAA status) (GOOG-RDGZ-00028472 at -474). The ad request itself does not contain the user's WAA or sWAA setting states; Google must use an identifier to look up the user's status (Monsees Tr. 96:1-13, 101:24-102:4).

121.     Like GA4F, Google uses its app advertising products to collect a wide variety of data, including events, parameters, and user properties.

122.     The Google Mobile Ads SDK, for example, automatically sends data relating to several types of ad events. These include ad requests, in which an app that uses AdMob, Ad Manager, or AdSense asks Google for an ad to display; ad impressions, in which an ad is shown in an app; ad views, in which the user views an ad displayed in the app; and ad clicks, in which the user clicks on an ad. In Google's Answer, it admits that the Google Mobile Ads SDK collects "app-

interaction[]" data "such as ad clicks and ad impressions" (Answer ¶ 66). The collection and saving

of an ad request are the first steps in Google's process of delivering an ad—a large part of Google's

business model. If Google did not collect and save ad requests, it could not serve ads. And without

data regarding both ad requests and the ads that Google served, Google would lack the records it

needs to charge advertisers for its services.[94] Google also uses this ads data to track conversions;

if it lacked data regarding a user's interaction with an ad, it would be unable to determine whether

that interaction is related to any later behavior.[95]

123.    As with GA4F, Google uses the Google Mobile Ads SDK to collect and save this event

data with substantial amounts of additional information. This information includes, but is not

limited to, IP address, timestamp, device identifiers (including ADID and IDFA), information

about the device (including location), and information about the ad content served (GOOG-RDGZ-

00164383 at -387; GOOG-RDGZ-00206388 at -399).

124.    The GMA SDK also sends other identifiers, such as the GAIA ID. As explained by internal

Google documentation, "For Android devices…the AdMob SDK obtains the GAIA-ID for the

default account signed into the device and creates a ▇▇▇▇ which is passed with every AdMob ad

request. For convenience of processing, the Gaia ID is passed in the same format as the DSID

cookie" (GOOG-RDGZ-00147439 at -452). The GMA SDK also sends an AdMob app ID

(admob_app_id), which identifies an AdMob app account (GOOG-RDGZ-00058520 at -520).

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[94] *E.g. Click Measurement Guidelines* at 16, Interactive Advertising Bureau, https://mediaratingcouncil.org/standards-and-guidelines (Last accessed March 17, 2023) (discussing "auditing guidelines," which include "counting methods"); *Mobile Application Advertising Measurement Guidelines* at 20, Interactive Advertising Bureau, https://mediaratingcouncil.org/sites/default/files/Standards/Mobile%20InApp%20Measurement%20Guidelines%20%28MMTF%20Final%20v1.1%29.pdf (Last accessed March 19, 2023) (same).

[95] *E.g.*, GOOG-RDGZ-00195736 at -37 (describing ▇▇▇▇ "conversion window[s]" for Google to connect the data).

WAA-on, sWAA-off; WAA-on, sWAA-on). The types of stored data are also the same regardless of these user settings.

202.    Google's January 31, 2023 production of data from its GA4F collection log also shows that Google saves GA4F data in non-GAIA logs using substantially the same structure and content as the data it saves in non-GAIA logs. Because Google stores a copy of "consented data" in both GAIA and non-GAIA logs, the timestamps, identifiers, and data stored in both types of logs make GAIA and non-GAIA data and ID joining straightforward. This means that if a user had WAA on or sWAA on for a time during the class period, their WAA-on and sWAA-on data links their non-GAIA identifiers to their GAIA IDs. Effectively, linking GAIA ID to a single non-GAIA record containing ADID or IDFA links all of the user's data with the same ADID or IDFA to that GAIA ID. The same can be said about app instance id and any other Google identifier that uniquely identifies an instance of an app.

### 3.    Google's Storage of WAA-off and sWAA-off App Ads Data

#### a.    App Ads Data Logging

203.    Like with analytics data, data collected by way of Google's app ads products are stored in Google logs irrespective of the user's WAA or sWAA status. The WAA and sWAA settings affect only which Google identifiers are used, and where the data is saved.

204.    As discussed in Section VII.A.2, when a user is signed into Google and has WAA or sWAA turned off, app ads data arrives at Google with both GAIA and non-GAIA identifiers. After the consent check, Google saves the data in long-term logs and the data may also be processed downstream through Google's ad stack.

205.    Like analytics data, WAA and sWAA merely control whether app activity data from non-Google apps is stored with a user's GAIA ID in Google logs. Specifically, when WAA/sWAA is on, the data may be stored with a user's GAIA ID; when WAA/sWAA is off, the data is stored

with a user's non-GAIA IDs.[136] Google's Supplemental Response to Interrogatory No. 23 explains: "When a user is logged into their Google Account and has turned WAA and/or sWAA off, any data that is collected by the Google Mobile Ads SDK is logged against pseudonymous identifiers."

206.    Google uses bits within ads logs to track the WAA and sWAA status of event-level data. Google's Supplemental Response to Interrogatory No. 17 explains: "Google identified a log called ▮▮▮▮▮▮▮▮▮▮▮▮ that indicates WAA and sWAA status alongside ad interactions, e.g., views and clicks, on App Campaigns designated app-install campaigns." Google relatedly admitted in its Response to Request for Admission No. 25 that "[a]t least one Google log contains one or more bits and/or fields that reliably shows whether specific event-level traffic was generated while WAA was off." Therefore, not only is Google saving WAA-off and sWAA-off data to class members' Google Accounts (both before and after the consent check) Google also marks some of the data as WAA-off or sWAA-off.

207.    On February 7, 2023, Google's counsel provided a list of "AdMob Logs" "identified through a reasonably diligent investigation of the logs AdMob may log ad interaction data to from devices used by users whose Google accounts may have had WAA or sWAA turned off at the time of the data was generated" (Feb. 6, 2023 Email from E. Santacana, Re: Rodriguez: Letter Brief on 9th Set of RFPs and Open Requests). This list of logs, shown below, includes both non-GAIA logs and personal logs. My understanding, based on reviewing Google's internal documentation, is that personal logs contain users' GAIA IDs (GOOG-RDGZ-00185868). Furthermore, Google's

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[136] Google states in Section 3 its Third Supplemental Response to Interrogatory No. 1, titled Consent Checks and Technical Barriers to Joining, that "[e]ach of WAA, sWAA, GAP, and NAC are account-level Web & App Activity and Ads Personalization controls. If sWAA, GAP, and NAC are all turned on, the result of the consent check is that the data can be tied to a user's Google account in what is known as 'GAIA space.' If any of these controls are off, then the data isn't joined to a user's Google account, and therefore not logged in 'GAIA space.'"

269.    Based on my experience with computing systems and my knowledge of data management and the advertising business, it also is my opinion that Google's collection and saving of WAA-off and sWAA-off Data does not result in any material incremental costs to Google's business. WAA-off and sWAA-off Data constitutes a relatively small portion of traffic compared to WAA-on and sWAA-on Data. Therefore, Google's collection and saving of WAA-off and sWAA-off (or Google's lack of doing so) has no material impact on Google's planning and budgeting for infrastructure, including physical space, data warehouse capacity, personnel, and marketing.

### 1.    Serving Advertisements While WAA or sWAA Is Turned Off

270.    As discussed earlier on Section VII.A.1., on Publisher apps, ads are served through the Google Mobile Ads SDK. In Google's Answer to Plaintiff's Fourth Amended Complaint, "Google admits that AdMob is a Google product that app developers may use to monetize mobile apps with targeted, in-app advertising" (Answer ¶ 60) and "Google admits that Google AdSense and Ad Manager are products that help a user sell products on a non-Google website or app" (Answer ¶ 70).

271.    Advertisements shown to users when WAA or sWAA is turned off rely on Google's collection and saving of WAA-off or sWAA-off data. Put differently, but for Google's collection of WAA-off or sWAA-off data, Google would not be able to serve advertisements to those users and then charge the advertisers because Google would lack the necessary data records to back up their advertising charges.

272.    As discussed above, Google's GMA SDK sends an ad request message to Google servers when a user views a page in an app containing a slot for an ad. This process occurs regardless of whether WAA and/or sWAA are on or off (Google's Supp. Resp. to Interrog. No. 23). If WAA and sWAA controlled Google's collection of this information by way of the GMA SDK, then Google would not return the requested ad to the publisher's app. Relatedly, as explained in more

278.    Ad personalization is impacted by two additional user controls: GAP (GAIA Ads Personalization) and NAC (New Ads Control).[153] Because Google does not use data collected by GA4F from WAA- and sWAA-off users to serve personalized ads, such WAA- and sWAA-off data is not used for ads personalization regardless of whether GAP and NAC are turned on or off. A WAA/sWAA-off user's GAP and NAC settings influence only whether Google serves ads that are personalized based on other data sources. "[A] user with 'GAP on AND (WAA-off OR sWAA-off …)' still has appreciably greater monetization potential than a user with 'GAP off'" because a GAP-on, WAA/sWAA-off user "is eligible for a subset of personalization scenarios (such as Customer Match)" that "does not include any audience targeting based on profiles generated from persisted activity data." GOOG-RDGZ-00042152.R at -156.R. Moreover, even where WAA and sWAA are off, Google can (provided GAP is on) serve personalized ads using data collected from when the user had WAA or sWAA turned on.

### 2.    Attribution/Conversion Tracking

279.    Google also uses WAA- and sWAA-off data to track and model advertising conversions. Conversions track how users respond to prompts, including advertisements. As explained by Google employee and 30(b)(6) witness Belinda Langner: "When we talk about conversion in the context of advertising, it is . . . whether or not a specific ad led to a specific action within the app and those actions can include things such as the first open or the in-app purchase" (Langner Tr. 133:13-23). As explained by Google employee Steve Ganem during his deposition: "On the Analytics side . . . a customer can indicate which events are conversions for them. For example, a

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[153] Both GAP and NAC settings are found under "Manage your Google Account" settings -> Data & Privacy -> Ads Settings. The "Ad personalization is on" slider is the GAP control and the "Also use your activity & Information…" check box is the NAC control.

purchase might be a common conversion for them. And when there is an occurrence of that event, that is marked as a conversion" (Ganem Tr, 269:20-270:2).

280.    The ability to capture conversion events, as well as the ability to attribute a conversion event to a prior ad event, allows Google to demonstrate the effectiveness of its advertising platforms to the advertisers, which in turn, increases advertiser spend on Google advertising platforms.[154] But for Google's collection and saving of WAA-off or sWAA-off data, Google would not be able to attribute conversions to events (like ad clicks) that occur when WAA or sWAA is off.

281.    Two attributions scenarios are relevant for this case when a user is signed into their Google account and has WAA or sWAA turned off.

- **Scenario 1**: When an ad is served through the GMA SDK (for AdMob or Ad Manager) in a 3P publisher app, Google's ability to connect this ad with a later conversion event like a purchase (on web or app) relies on Google's collection of app ads data (i.e., ad impressions, clicks, and similar data) via the GMA SDK, and the saving of this data in its logs for later attribution. If the publisher app also uses GA4F, the collected analytics data may be used as well.

- **Scenario 2**: When an ad is served elsewhere (e.g., on google.com, youtube.com, 3P websites, or a Google app), Google's ability to connect this ad with a later conversion event in a 3P app implementing GA4F relies on Google's collection of app analytics data via the GA4F SDK, and the saving of this data in its logs and data storage for later attribution.

282.    Thus, Scenario 1 relies on Google's collection and saving of WAA- and sWAA-off data from publisher apps implementing the GMA SDK (and GA4F if available). Scenario 2 relies on Google's collection and saving of WAA- and sWAA-off data from advertiser apps that use GA4F. Some studies have reported a 10% - 20% performance uplift when advertising platforms are

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[154] "[W]e do conversion measurement as a way to show the value that the Google app campaigns have brought to a specific advertiser" (Langner Tr. 215:11-14). This is true even when sWAA is turned off (Langner Tr. 215:15-218:4).

integrated with GA4F (GOOG-RDGZ-00196222 at -244). If Google stopped collecting and saving WAA/sWAA-off data from users' activities on non-Google apps, both attribution scenarios would fail.

283.   For example, for App Campaigns,[155] also known as "App Promo," advertisements promoting apps can be run on websites and in apps, including in apps that use the GMA SDK.[156] "App campaigns can show ads across the various different Google properties and Google's ad networks. App campaigns can show an advertiser's app promotion ad within search or what we would call Google.com" (Langner Tr. 161:17-22).

284.   In a particular scenario where an app ad click led to a conversion event in a different app, Ms. Langner explained the conversion attribution flow as follows: "The Google Ads systems can choose to display an ad to a specific user like we talked about within an app, okay? That user can then click on that ad. That information is all logged. When a user then is taken to the App Store, downloads the app and then opens the app for the first time, Google Analytics for Firebase may send a first open event assuming a number of the conditions that we talked about, right, including the fact that . . . Google has to do something called an attribution so we have to confirm on the ad side that this specific device, IDFA or Ad ID, was shown the ad and then the attribution happens on that specific conversion event" (Langner Tr. 156:14-157:10).

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[155] "[A]pp campaigns is an ad campaign type, right, that allows advertisers to promote their app, their mobile app" (Langner Tr. 109:11-14). See Appendix E for a discussion of other types of advertising campaigns.
[156] "So AdMob, right, shows ads that allow advertisers who want to promote their app, right, and there are also advertisers that want to promote their website" (Langner Tr. 111:22-112:1) and "So app campaigns, right, are -- are campaigns where an advertiser can promote their mobile app, right, and they -- and through this, advertisers can specify the specific app conversion that they want to drive towards. These types of events can include things that I mentioned earlier such as first open and in-app purchases. Google then decides to show those advertisements promoting that advertiser's mobile app on various different properties and the Google ad -- and the Google ad networks that we -- we have, including AdMob, as we had mentioned" (Langner Tr. 118:23-119:13). Google . . . chooses to optimize to find the right users who may be more likely or have a higher propensity to perform those specific actions that the advertisers specified" (Langner Tr. 151:2-152:5).

285.    Ms. Langner also testified about the role played by GA4F for conversion tracking, particularly for App Campaigns. "Google app campaigns use[] app conversions for reporting to advertisers in our app campaigns," (Langner Tr. 25:16-18) and "GA analytics for Firebase, GA4F, specifically collects app conversions and so that is specifically relevant for advertisers who are promoting their app" (Langner Tr. 112:5-9). GA4F is used to "collect data, specifically app conversion data, and that includes certainly first opens, right, so when a user first opens, or in-app purchases or other specific events that a developer would -- would define in Google Analytics for Firebase" (Langner Tr. 113:19-114:1). "[W]hen it comes to the Google Analytics for Firebase data, all of the conversions that happen within a specific app and are collected by Google Analytics . . . . App conversion data can be used then, right, by the Google Ads systems and so -- and -- and that's primarily used by app campaigns" (Langner Tr. 147:24-148:7).

286.    In written discovery, Google has separately admitted that it tracks conversions for app campaigns (i.e., App Promo) by way of GA4F. ████████████████████████████████

████████████████████████████████████████████████████████████████████ " (Google's Supp.

Resp. to Interrog. No. 17). ████████████████████████████████████████████████████

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287.    Ms. Langner also explained that Google uses non-GAIA identifiers to track conversions. "Specifically for Firebase conversions, Google uses pseudonymous identifiers, such as IDFA or ADID for the purposes of conversion measurement" (Langner Tr. 32:10-13). "For Google Analytics for Firebase data, when the user has sWAA-off, the Google Ads systems can use data in this pseudonymous space for the purposes of conversion measurement" (Langner Tr. 185:13-17). Mr. Ganem, another 30(b)(6) witness, provided similar testimony. In response to a question about whether Google uses IDFA and ADID for conversion tracking, Steve Ganem responded, "Yes, it

does" (Ganem Tr. 251:13). Mr. Ganem continued: "Yes, for example, when a user clicks on an ad, say, from another ad network, and the IDFA and ADID are collected, and they eventually convert. . . . [A]ssuming that the IDs are available, then Google Analytics will do a match between them and match the conversion to the click" (Ganem Tr. 251:20-25, 252:5-8) (describing how, if "ADID and IDFA are available, [Google] would do a Device ID-based conversion measurement")).

288.    Ms. Langner also described how Google ultimately benefits from its ability to track conversions. "In the context of ads, advertisers are able to target for users who are more likely to do a specific event … and Google makes money by driving more -- through the ad impressions and the ad clicks that we drive to -- to help app advertisers reach their marketing goals" (Langner Tr. 213:15-23). "The app campaigns will try to find more users that are likely to perform those actions, and advertisers specify specific target that they would like to pay for every single action and Google tries to optimize towards those targets. So by driving -- by basically, you know, advertisers, when we reach their goals, you know, may -- and reach their ROI goals may -- may choose to adjust their budgets accordingly with -- with Google and the Google Ads systems" (Langner Tr. 214:10-215:1).

289.    Steven Ganem provided similar testimony. "in the event proto, there's - sort of the event proto tab, there's an indication, for example, of the event name. And if that was an event that the customer had marked as a conversion, then there would be an – basically, we would know that that is an event that the customer deems important" (Ganem Tr. 270:15-20).

290.    Google's trillion-dollar advertising engine relies on ad performance measurements that report to advertisers how effective their ads have been and prove that Google's ads meet industry standards for traffic quality.

291.    In its response to Request for Admission No. 37, Google denied using WAA-off data to track, model, or measure conversions that occur across Google and non-Google properties, but other discovery contradicts that assertion. For example, in Response to Interrogatory No. 15, which asked about "how Google currently uses and previously . . . has used WAA-off Data," Google admitted that Google uses WAA- and sWAA-off data for "pseudonymous conversion tracking." Google's Supplemental Response to Interrogatory No. 15 further explains: "DeviceID-keyed advertising interactions with an advertiser, such as views and clicks of that advertiser's ads, are joined to conversions recorded in that advertiser's app using Firebase (or other third party conversion tracking products or services)." Google tracks "when the same device that interacted with [an advertiser's] ad subsequently converted (e.g., opened their app, or made an in-app purchase, depending on how the advertiser has defined a conversion for the ad campaign)."

292.    That interrogatory response cannot be reconciled with Google's response to Request for Admission No. 37, where Google denied that it "has used WAA-Off Data to track, model, or measure conversions that occur across Google and non-Google properties." If Google attributes a WAA/sWAA-off user's interaction with an advertisement in one place to the user subsequently opening that advertiser's app and/or making a purchase, then Google tracks, models, or measures conversions that occur across Google and non-Google properties.

293.    Google employee Belinda Langner discussed how device-level controls available to users (i.e., LAT ATT, and OOOAP, which I discussed in Section VII.A.1) affect how Google tracks conversions.

294.    But any impact to Google's ability to track and model conversions is offset by several mitigating measures. For IDFA specifically, an internal Google document explains that data generated by LAT-disabled users are "used to model conversions for LAT-enabled users" (GOOG-

RDGZ-00197928 at -930). "Modeling" is what it sounds like. For example, Google "[u]se[s] linked data as truth set to model conversions that we think are driven by a Google Ad interaction . . . . We don't associate a click with a conversion; we only guess which set of conversions are driven by our ads" (GOOG-RDGZ-00056108 at -116).

295.    Google also implemented conversion modeling for iOS14.5, "serving on all zero IDFA traffic across all stacks" (GOOG-RDGZ-00197101 at -106). Google explains that "conversions whose ads originate on ATT impacted traffic will experience modeling" (GOOG-RDGZ-00142709 at -710). One such conversion modeling algorithm is a machine learning algorithm called iDog for iOS; the "beta launched in early July 2018" (GOOG-RDGZ-00193001 at -005). Other conversion modeling projects are discussed in Appendix E. Appendix E also discusses Google's implementation of an aggregated ID called GBRAID ID (Google Broad Ad ID[157]), which Google used in response to ATT for aggregate conversion tracking.

296.    Moreover, advertisers can opt out of running ads campaigns against "LAT-enabled inventory" (GOOG-RDGZ-00197928 at -931). As for Android, the loss of ADID is "limited to loss of measurability for view-through based conversions (EVCs and VTCs), as well as losses due to undetected IVT [invalid traffic[158]] traffic" (GOOG-RDGZ-00208099 at -105). Contextual Advertising and frequency capping (limiting the number of times an advertisement is shown to the same user) are not impacted by ADID (GOOG-RDGZ-00208099 at -103).

### 3.    Improving Google Products, Processes and Services

297.    Aside from using WAA-off and sWAA-off data for serving advertisements and tracking conversions, Google also used WAA-off and sWAA-off data for product development, improvement, and diagnostics. Google's 4th Supplemental Response to Interrogatory No. 1,

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[157] GOOG-RDGZ-00178406 at -407
[158] GOOG-RDGZ-00189134 at -139

# Appendix A-12

**Appendix E**
**Ad Campaigns and Conversion Tracking/Modeling**


**Table of Contents**

## 1    Types of Ad Campaigns

1.      Non-Google apps use Google's advertising platforms called Google Ads (formerly known as Google AdWords[1]) and/or Display & Video 360 (formerly known as DoubleClick Bid Manager[2]) to manage their advertising campaigns. A non-Google app developer can specify a few different types of ad campaigns, including but not limited to App, Search, Display, and Video.[3]

### 1.1    App Campaigns (App Promo)

2.      An App Campaign (also called "app promotion" or "app promo" campaign) has three options that advertisers can select from[4]:

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[1] "Google Ads Rebrand for AdWords, as of August 2018" (GOOG-RDGZ-00193001 at -004).

[2] "We've unified our DoubleClick advertiser products and the Google Analytics 360 Suite under a single brand: Google Marketing Platform. As part of the launch of Google Marketing Platform on July 24, 2018, the following changes occurred to DoubleClick Digital Marketing products: DoubleClick Bid Manager is now Display & Video 360, a product that brings together planning, creative, buying, and measurement features into a single tool." *Introducing Google Marketing Platform*, Campaign Manager 360 Help, https://support.google.com/campaignmanager/answer/9015629?hl=en (Last accessed March 15, 2023).

[3] *Choose the Right Campaign Type*, Google Ads Help, https://support.google.com/google-ads/answer/2567043 (Last accessed March 15, 2023).

[4] *About App Campaigns*, Google Ads Help, https://support.google.com/google-ads/answer/6247380 (Last accessed March 15, 2023).

- <u>App Installs</u> – run ads that encourage users to install an app. A user clicking on the ad is taken to an app store to install the app. Such ad campaigns are called App Campaigns for Installs (ACi) (GOOG-RDGZ-00056514 at -517).

- <u>App Engagement</u> – show ads to users who have already installed an app. App engagement ads encourage users to come back to a specific part of the app to make a purchase, book a flight, etc. Such ad campaigns are called App Campaigns for Engagement (ACe) (GOOG-RDGZ-00056514 at -517). App developers configure what are called "deep links," which "send mobile device users directly to relevant pages in [an] app rather than [a] website."[5]

- <u>App Pre-registration (Android only)</u> – run ads for apps before they are released on Google Play. These ads generate user's interest in an app that has not been released. "Before an [] app is released on the Google Play Store, users have the option to pre-register for [the] app or game. On the first day of launch, users receive a notification to install the app" (GOOG-RDGZ-00194335 at -395). App pre-registration was beta tested in 2019 and launched in 2020 (GOOG-RDGZ-00067938 at -940).

3.    App Campaign ads can "appear across Google's properties. This includes Google Search, Google Play, YouTube, the Google Display Network, AdMob, Discover on Google Search, [Google's] search partners, and many more publishers who host app ads."[6] Within apps, App Campaign ads can be served by the Google Mobile Ads SDK (which supports AdMob and Ad Manager).

4.    App Campaigns were previously called Universal App Campaigns (UAC). Google renamed UAC to App Campaigns in February 2019.[7] UAC itself was launched in 2015. At that time, UAC campaigns "allow[ed] an AW [AdWords] app advertiser to run one simple campaign across 5 channels: Google Play, Search (Google.com), AdMob, mGDN [mobile Google Display Network] & YouTube" (GOOG-RDGZ-00081274 at -275). UAC Campaigns and its successor, App Campaigns, "use[] machine learning to make the smartest decision for each ad, analyzing

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[5] *About Deep Links*, Google Ads Help, https://support.google.com/google-ads/answer/10023042 (Last accessed March 15, 2023). ACe falls back to the app store if the app is not actually installed, although Google clarifies that "[t]his is an edge case, since we try to avoid serving ACe campaigns to users who don't have the app installed" (GOOG-RDGZ-00056514 at -517).

[6] *About App Campaigns*, Google Ads Help, https://support.google.com/google-ads/answer/6247380 (Last accessed March 15, 2023).

[7] *Universal App Campaigns Are Now Simply App Campaigns*, Google Ads Help, https://support.google.com/google-ads/answer/9256714 (Last accessed March 15, 2023).

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hundreds of millions of potential signal combinations in real time" to serve app ads across "Google Play, Google.com, YouTube and the millions of sites and apps in the Display Network" GOOG-RDGZ-00081274 at -275.[8] As Google explained to app developers, "Universal App Campaigns is combining rich data about user actions, intent and context with smart machine learning to show your ads to the right person in the moments that matter…Machine Learning is UAC's underlying source of success combined with data and Google's distribution channels" (GOOG-RDGZ-00195309 at -508). With UAC, Google dynamically generates ads as well as bid price to reach app developers' cost-per-install (CPI) targets (also called target cost-per-install tCPI).[9]

5.      While UAC initially focused on app installs to encourage new users to try an app (App Campaigns for Installs (ACi) or formerly just as UAC (GOOG-RDGZ-00182145 at -145)), Google later added App Campaigns for Engagement (ACe) (also referred to as UACe) (GOOG-RDGZ-00193001 at -006) to encourage existing app users to come back to an app that is already installed. Google fully launched ACe towards the end of 2020 after beta testing. Google required app developers to implement app conversion[10] tracking and deep linking, and to have a minimum of 250,000 app installs.[11] To run ACe campaigns, "Advertisers upload a pre-defined audience (user-lists of device IDs), set a tCPA [target Cost per Action] for a specific action (e.g. app open, or virtual good purchase) and upload a set of creative assets. ACe then optimizes across all inventory channels to delivery maximum conversions at the target CPA…ACe's bidding is 100% driven by

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[8] Sissie Hsiao, *Propel Your Mobile App Growth With Universal App Campaigns*, Google Ads, https://www.blog.google/products/ads/propel-your-mobile-app-growth-wi/ (Last accessed March 15, 2023).
[9] Ginny Marvin, *Google's New Universal App Campaigns Push App Promotions Across Search, YouTube, AdMob, Display*, Search Engine Land, https://searchengineland.com/google-adwords-universal-app-campaigns-push-ads-221813 (Last accessed March 15, 2023). GOOG-RDGZ-00195309 at -534 discusses auto-generated video ads. GOOG-RDGZ-00196620 at -627 discusses auto-generated image ads.
[10] A conversion event is an advertiser defined metric that is important to their business. For example, app install and purchase within an app can be conversion events. Google keeps tracks of these conversion events and later makes the connection between a conversion event and a prior ad view or ad click in a process called "attribution."
[11] *App Campaigns For Engagement Now Available For Eligible Advertisers Globally*, Google Ads Help, https://support.google.com/google-ads/answer/10287275 (Last accessed March 15, 2023).

Machine Learning…ACe will look across Search, AdMob, YouTube, and Play for users relevant to the inputted business goals" (GOOG-RDGZ-00204430 at -434 and -435).

6.    Google tracks "app installs and in-app events in Google Ads" using GA4F (GOOG-RDGZ-00201148 at -160). Google explained to app developers in 2016 that "UAC will work seamlessly with Firebase Analytics … and continue to integrate with the top 3rd party app SDK's. We're especially excited about Firebase as it provides prebuilt engagement and in-app actions that will help you manage your conversions. And when you funnel these conversions into Adwords - UAC will automatically optimize to them. So, for app developers who want to find those users most likely to take meaningful actions, like reach level ten of their game, purchase that new camera, or book a vacation we've made it easier than ever" (GOOG-RDGZ-00195309 at -493).

## 1.2    Other Types of Ad Campaigns

7.    Aside from App Campaigns, Google Ads and Display & Video 360 (DV360) also support other types of ad campaigns, including Search, Display, and Video.[12] Search campaigns run ads on search results pages across Google.com and Google's search network[13] to show ads to people searching for a particular product or service. Display campaigns run ads across websites and apps as users browse websites and mobile apps.[14] Video campaigns run videos ads across YouTube and other websites and apps running on Google video partners.[15]

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[12] *Choose the Right Campaign Type*, Google Ads Help, https://support.google.com/google-ads/answer/2567043 (Last accessed March 15, 2023).

[13] Google explains  that "[t]he Google Search Network is a group of search-related websites and apps where your ads can appear. When you advertise on the Google Search Network, your ad can show near search results when someone searches with terms related to one of your keywords." *About the Google Search Network*, Google Ads Help, https://support.google.com/google-ads/answer/1722047 (Last accessed March 15, 2023).

[14] Google explains  that "Display campaigns serve visually engaging ads on the Google Display Network. The Display Network helps you reach people as they browse millions of websites, apps, and Google-owned properties (such as YouTube and Gmail)." *About Display Ads and the Google Display*, Google Ads Help, https://support.google.com/google-ads/answer/2404190 (Last accessed March 15, 2023).

[15] *About Video Campaigns*, Google Ads Help, https://support.google.com/google-ads/answer/6340491 (Last accessed March 15, 2023).

8.      Users interacting with Search, Display, and Video ads can later perform a conversion action either on an advertiser's app or website. Appify (externally called "App Deep Linking" (GOOG-RDGZ-00198933 at -938)) is a Google technology layer that enables ads shown under these types of ad campaigns to "deep-link into apps using URLs. This is a strategically important way to drive app conversions and therefore part of the app attribution story. App conversion tracking is complex since conversions can occur either on an app's mobile website (no deep link) or in the app itself (Appify deep link). Appify works when an advertiser sets up app links (Android, iOS). When app links are set up, mobile users who click on an ad with a URL landing page are not promoted to choose how to open the link but are instead taken directly to the advertiser's app. Mobile users who don't have the advertiser's app installed and users on Desktop are directed to the advertiser's website" (GOOG-RDGZ-00056514 at -518). Appify was launched by June 2019, with open beta launched earlier (GOOG-RDGZ-00198033 at -034 and -036).[16] Google later referred to Appify as Web to App Connect (W2AC) (GOOG-RDGZ-00202401 at -408).[17]

9.      While both ACe and Appify may lead a user to apps, Appify is different from ACe. As Google explains, "ACe is a dedicated App Campaign type which re-engages app users by targeting audience lists of existing app users" whereas "Appify applies to existing Search, Display and Shopping (web) campaigns, and directs users to the app if the user already has the app…For ACe,

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[16] *See also* GOOG-RDGZ-00202401 at -424 ("Last year at Google Marketing Live, we announced app deep linking from Search, Display and Shopping ads. In the coming months, we'll be rolling out deep linking from YouTube, Hotel, Gmail and Discovery ads. On average, deep linked ad experiences drive 2X the conversion rates.); Prabhakar Raghavan, *Google Marketing Live: Building for the New Consumer Journey*, Google Ads & Commerce Blog, https://blog.google/products/ads/new-ad-innovations-new-consumer-journey/ (Last accessed March 17, 2023) ("over the next few weeks, we'll enable app deep linking from Google Ads and offer more robust reporting across web and apps. Your app users will be taken directly from your Search, Display and Shopping ads directly to the relevant page in your mobile app, if they have your app already installed."); Allison Schiff, *Google Is Doubling Down On Deep Linking*, AdExchanger, https://www.adexchanger.com/mobile/google-is-doubling-down-on-deep-linking/ (Last accessed March 17, 2023) ("Google bolstered its deep linking offering on Wednesday by enabling from YouTube ads, Hotel ads, Gmail ads and ads in Discovery, which is the main section of the Google app. Previously, it had only been available in search, display and Shopping ads.").
[17] Firebase Dynamic Links is not supported by Web to App Connect. "Web to App Connect (fka Appify)…only support App Links (Android) and Universal Links (iOS)" (GOOG-RDGZ-00201684 at -745).

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all traffic is directed into apps, whereas for campaigns with Appify, a large portion of the traffic will continue to be sent to websites" (GOOG-RDGZ-00202401 at -516).

10.    By 2019, "the Google Analytics for Firebase (GA4F) SDK … [was made] mandatory for the next generation of UAC/UACe/Appify features" (GOOG-RDGZ-00054819 at -821).

## 2    Conversion Tracking/Modeling and Attribution Overview

11.    Google demonstrates the effectiveness of its advertising platforms to advertisers through the ability to track conversion events as well as the ability to attribute that conversion event to a prior ad interaction event. The data collected allows Google to develop machine learning algorithms to determine the optimal bid price and to model conversions when conversion tracking is unavailable. These are discussed in more detail in this section.

### 2.1    Conversion and Attribution

12.    There are three types of conversions: Click-through-conversions (based on ad click), Video engagements (when a user watches a video for more than 10 seconds), and View-through-conversions (based on a viewable ad impression) (GOOG-RDGZ-00056514 at -518).

13.    Within non-Google mobile apps, Google tracks conversion events through Firebase, which is designed to track individual events. This is contrasted with older Google Analytics products that track conversions based on browsing sessions. As explained by Google, "[h]istorically, Google Analytics for websites had a sessions-based data model where conversions were defined as 'did this session convert' rather than 'did a conversion happen', whereas AWCT [AdWords Conversion Tracking] and Floodlight had a much simpler 'event-based' data model that directly spoke to 'did a conversion happen'. This was addressed head on with Google Analytics for Firebase (GA4F), which moved to an event-based data model for app analytics and conversion tracking so that it also answered 'did a conversion happen'. This was a major contributing factor to AWCT for apps

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being deprecated and replaced by GA4F. Google Analytics '███' is the expansion of GA4F such that it will replace all of Google Analytics classic. The result is that all Analytics for web, app, and hybrids will leverage the event-based model going forward" (GOOG-RDGZ-00054819 at -821).

14.     "Since 2016, Google Analytics for Firebase users [in this context, app developers] have been able to link their Firebase app with their corresponding Play app to allow Play data (e.g. IAP [in-app-purchase] events) to flow into their Firebase project. This integration has enabled users to track IAP conversions for AdWords and DoubleClick, add another metric for segmenting audiences and LTV, and much more" (GOOG-RDGZ-00194335 at -423).

15.     Conversion events may also be tracked by Google's App Attribution Partners (AAPs).[18] "Developers tracking conversions using AAP SDKs wouldn't go through Google Analytics but can still notify Google Ads when conversions happen. Google ads reporting currently supports conversion imports from FiB [Bidding on Firebase[19], Google Play, and a variety of AAPs…However, advertisers will need to use the Firebase SDK if they want to employ automated bidding in Google Ads" (GOOG-RDGZ-00056514 at -517).

16.     To complete ad performance measurement, an attribution process is implemented to determine which prior user ad interaction led to a conversion event.[20] "App attribution is a bit different from web attribution. In place of cookies or image pixel tags are SDK identifiers, advertising IDs, referrers [Android only], click data, and other information. Since users engage with apps over a period of time, there's also added emphasis on lifetime value when it comes to app attribution" (GOOG-RDGZ-00056514 at -514).

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[18] "The App Attribution Partner (AAP) Program is a formal partnership program between 3rd party app tracking providers and Google to measure the performance of app campaigns in AdWords" (GOOG-RDGZ-00193001 at -004).
[19] GOOG-RDGZ-00198985 titled "Appify – Bidding on Firebase Conversions – PRD" and go/fib-conversions-bidding-prd.
[20] Google applies machine learning to determine attribution with what is called Data-driven attribution (DDA) (GOOG-RDGZ-00056514 at -518).

17.    One way for doing attribution is shown in GOOG-RDGZ-00061704 at -723, reproduced in the figure below. This particular attribution flow relies on device IDs (in this case, IDFA) to match an ad click to a conversion event tracked by GA4F. As noted in the figure below, this is only one of many ways Google performs attribution.
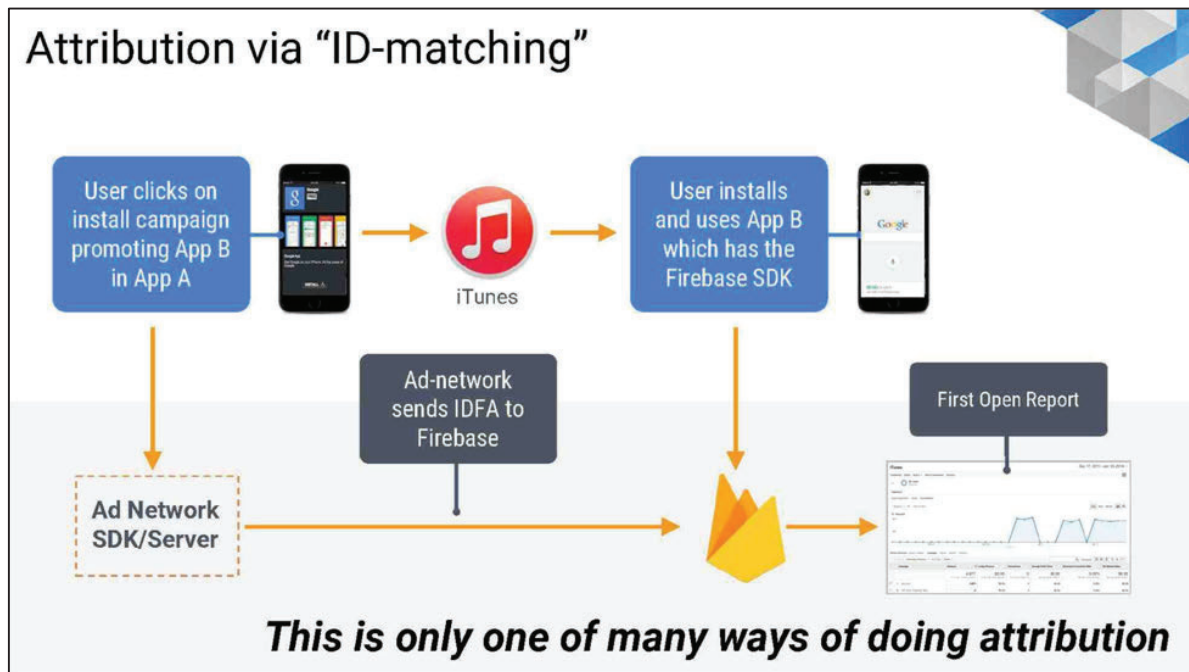


18.    When devices IDs are not available, conversion tracking/attribution may be enabled using GCLID (Google Click ID). "Firebase sdk can extract the gclid using two ways – Deeplink click url for Appify/ACe" and "Play Referrer API for ACi" (GOOG-RDGZ-00177322 at -322).

19.    When both device ID and GCLID are not available (for example, with Apple's App Tracking Transparency in iOS14), Google implemented an aggregated ID called GBRAID ID (Google Broad Ad ID (GOOG-RDGZ-00178406 at -407)), which is passed from deeplink URLs to Gold and Ads for Appify (GOOG-RDGZ-00054816 at -818; GOOG-RDGZ-00187249 at -264). Google explains that "[i]nstead of using gclid which is used to tie back the conversion to a click (and thus a user), Ads will be using an aggregated ID (CampaignID / AdgroupID) which generally

maps to multiple users. As a result, we do not know which user has converted but we would still be able to measure the number of conversions that occurred at the aggregate level. SDK stores GBRAID as user property and sends it for each conversion. Besides sending GBRAID to App Ads along with conversions in the BOW ping, Attribution unpacks GBRAID and matches it to random clicks with the same cohort. Thresholding will be applied to make sure a conversion is dropped if the number of clicks from the GBRAID on that date is too few" (GOOG-RDGZ-00177752 at -755 to -756).

## 2.2   Bidding

20.     When an ad slot becomes available as a user browses a website or an app, multiple advertisers will compete to have their ad shown to the user. The advertiser's ad that gets shown is determined through a bidding process where advertisers submit their interest for the ad slot as well as a bid price. There are several different bidding strategies depending on the type of ad campaign and the advertiser's goal, including maximizing the number of clicks, impressions, conversions or views.[21] For example, if an advertiser wants to maximize the number of app installs or in-app events, they may choose to maximize conversions using Google's Smart Bidding, available since mid-2016.[22] Advertisers have the choice to optimize several metrics, including target cost-per-install (tCPI) or target cost-per-action (tCPA).[23] In addition, Google launched Target Return on Ad Spend (tROAS) (equal to a user's lifetime value (LTV), which measures the value of the user

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[21] *Understanding Bidding Basics*, Google Ads Help, https://support.google.com/google-ads/answer/2459326 (Last accessed March 15, 2023).
[22] Anthony Chavez, *Get More Powerful Bids Automation With New AdWords Smart Bidding*, Google Ads & Commerce Blog, https://www.blog.google/products/ads/more-powerful-bid-automation-with-smart-bidding/ (Last accessed March 15, 2023).
[23] "Smart Bidding refers to bid strategies that use machine learning to optimize for conversions or conversion value in each and every auction—a feature known as 'auction-time bidding'. Target CPA, Target ROAS, Maximize conversions, and Maximize conversion value are all Smart Bidding strategies." *About Smart Bidding*, Google Ads Help, https://support.google.com/google-ads/answer/7065882?hl=en (Last accessed March 15, 2023).

to an app / Cost) (GOOG-RDGZ-00066625 at -633) in 2019.[24] Google explains to app developers

that "Google Ads Smart Bidding and Smart Creative solutions use machine learning that analyzes

millions of signals in real time to show the right message to the right customer in the moments that

matter. So instead of having to spend time manually optimizing your ads or bidding, you can get

better results faster with the help of automated solutions."[25] Google further explains to app

developers, "Smart Bidding is a set of automated bidding strategies that use machine learning to

optimize for conversions or conversion value. Smart Bidding sets precise bids for each and every

auction to help drive higher conversion volume or conversion value at a cost efficiency that is

comparable to or better than existing performance goals."[26] Advertisers can also set bid price

manually.[27] However, ███████████████████████████ " (GOOG-RDGZ-00195309 at -516).

21.    Appify, for example, leverages Smart Bidding for significant revenue gains for advertisers

and Google. As Google explained, ██████████████████████████████████████

████████████████████████████████████████████████████████████

███████████████████████ Today, Smart Bidding for Appify (also known as conversion

optimizer) is available on Search. This means that: when we detect that the app is installed on the

user's device, we will bid higher on that Search ad for a higher chance of mCVR [Mobile

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[24] An internal Google document states ███████████████████████████████████████████████

(GOOG-RDGZ-00207461 at -465). A May 2019 Google blog article stated "tROAS will be available next month for Google App campaigns on iOS and Android globally." Sissie Hsiao, *Smart Strategies For Growing Your App Business with Ads*, Google Ads & Commerce Blog, https://blog.google/products/ads/google-io-ads-announcements/ (Last accessed March 15, 2023).
[25] *About Smart Bidding and Smart Creative Solutions with Google Ads*, Google Ads Help, https://support.google.com/google-ads/answer/9297584?hl=en (Last accessed March 15, 2023).
[26] *Your Guide to Smart Bidding*, Google Ads Help, https://support.google.com/google-ads/answer/11095984 (Last accessed March 15, 2023).
[27] *About Bidding in App Campaigns*, Google Ads Help, https://support.google.com/google-ads/answer/7100895 (Last accessed March 15, 2023).

Conversion Rate]. This is going to launch on PLA [Product Listing Ads] in Q3'20 . . ." (GOOG-RDGZ-00202401 at -448).

22.    Conversion tracking and attribution are key to bid optimization in order to maximize the likelihood of an ad leading to conversion. As Google explains, "Advertisers utilize app tracking SDKs to track app conversion events, and use these for bidding" (GOOG-RDGZ-00198985 at -985). "Accurate conversion data is critical for bidding performance — both for customers using Google auto-bidding, and those bidding manually. If conversion data becomes less granular and accurate, reduced bidding performance may lead to decreased advertiser investment in Google" (GOOG-RDDGZ-00148902 at -922).

23.    Conversion tracking can be set up in Google Ads with conversion data imported from measurement ███ such as GA4F or AAPs. Once the advertiser organizes conversion events by measurement ███ such as GA4F into goals (e.g., Purchase), performance of future ad bids will be measured against conversion events tracked by GA4F. As Google explains, "[b]id on Firebase conversions … including GA4F app events in 'account-level goals', previously known as 'include in Conversions'. This allows to boost performance of deep linked campaigns: more than 2X conversions" (GOOG-RDGZ-00202401 at -455).

24.    When GA4F was released, relatively few developers bid against conversions tracked by GA4F. In response to the relatively small percentage of advertisers bidding on GA4F conversions, Google implemented a project internally called Project Uno to "Drive adoption of Google Analytics for Firebase (GA4F ███)" (GOOG-RDGZ-00200228 at -242; *see also* GOOG-RDGZ-00177709 at-710). As stated in an internal Google document, the goal of ████████ was to grow "mobile revenue with 100% of biddable[28] in-app and install conversions on Firebase only (GOOG-

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[28] Google explains that "biddable = included in the 'conversions' column" for Google Ads reporting (GOOG-RDGZ-00202401 at -448).

RDGZ-00111850 at -851) and "⬛⬛⬛⬛ drives migration from AAP to 1P (⬛⬛⬛⬛ This allows bidding optimization to rely on 1p path" GOOG-RDGZ-00196620 at -672). Google explained that "[e]specially because of the 1P⬛⬛ Strategy (⬛⬛, Google Analytics plays a more strategic and impactful role in our growing Apps business (~$10B ARR) than ever before. Unlike on web, our SDK and product are on the critical path to our App advertiser products, including Appify, and we have a big opportunity to drive incremental value because of our advertiser footprint" (GOOG-RDGZ-00059723 at -728). Rahul Oak, the former App Ads "lead" on Project Uno, described Project Uno as an effort "to build features to make [Google's] advertising products more efficient and more useful for advertisers," including through building "machine-learning models" (Oak Tr. 109:23-110:1, 110:6-10).

25.     Google enticed advertisers to adopt GA4F in their apps by advertising that GA4F adoption would (1) create a 10-20% estimated performance gain for advertisers and (2) enable new features available only with GA4F, such as optimizing ⬛⬛⬛⬛⬛⬛⬛⬛ in advertising (GOOG-RDGZ-00202698 at -700). Ironically, one of the benefits Google pitched to advertisers to switch from AAPs to GA4F was user transparency and control, shown in the figure below (GOOG-RDGZ-00197718 at -739). Google claimed that users can view their data in their My Account page, but as I discuss in my report, this only applies when users are signed-in and have turned WAA-on and sWAA-on. Contrary to what Google told developers, Google does not "surface[] to users" the data that Google "collect[s] via [its] ⬛⬛" if the user has turned off WAA or sWAA; users have no "transparency and control[]" over Google's collection of this data.
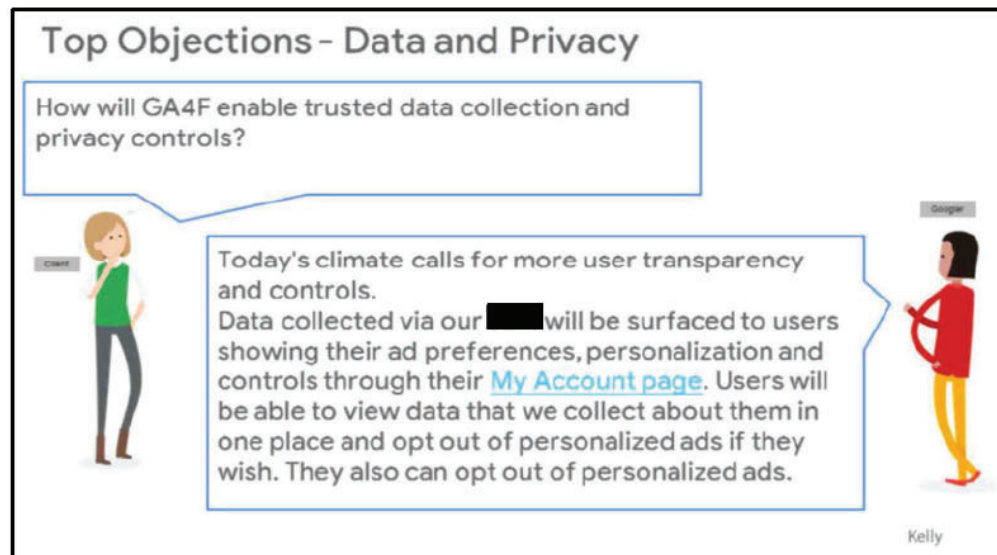
26.    Google's ▮▮▮▮▮ has been quite successful since its launch in early 2019. Google's Supplemental Response to Interrogatory No. 17 states: "Google tracks app campaign ad spend that is bid against different types of conversions. As of last month [October 2022], approximately 55% of app campaign ad revenue was attributable to conversion types bid against GA4F (as opposed to other sources of conversions). Before ▮▮▮▮▮ which launched in approximately 1H 2019, this percentage was significantly lower–approximately 6% or less. By October 31, 2019, this percentage was 10.6%. By October 21, 2020, it was 29.4%. By October 1, 2021, it was 49.4%. By October 1, 2022, it was 54.9%."

## 2.3    Conversion Modeling

27.    When precise conversion tracking or attribution is not possible, Google uses machine learning algorithms to perform conversion modeling. As Google explains, "Google has used conversion modeling in conversion reporting for years … modeling has always been necessary in environments where we cannot fully link ad interactions to conversions. More recently, we have modeled conversions for apps, when the ad originates on iOS … When Google surfaces modeled conversions in Google Ads, we are predicting attributed conversions. In most cases, Google will

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receive ad interactions and conversions but is missing the linkage between the two. The modeling

we perform is modeling whether a Google ad interaction led to the conversion, we are not modeling

whether a conversion happened or not" (GOOG-RDGZ-00142709 at -709). Google further

explains that "[i]n order to model for the non observed slice, we try our best to use data from high

fidelity observable slices where we know behaviour is the same or very similar to the unobserved

slice … We leverage ground-truth from historical conversion rates, device type, time of day, geo,

operating system, and more, to predict the likelihood of a conversion event across the set of users

who viewed or clicked on an ad" (GOOG-RDGZ-00142709 at -711).

28.     For app ads, Google explains that "[t]oday, the Google Ads Front End (GAFE) does not

distinguish between modeled conversions and non-modeled (i.e. deterministically measured)

conversions. On App Ads, we create modeled conversions for ▮▮▮▮ (modeling x-device

conversions) and ▮▮▮▮(modeling mobile web search conversions…)" (GOOG-RDGZ-00208133

at -133). In another document, Google explains that ▮▮▮ performs "iOS conversion modeling

based on ML [machine learning]. Beta launched in early July 2018" (GOOG-RDGZ-00193001 at

-005) and ▮▮▮▮ is a "Project name for iOS conversion tracking tying Zweiback Cookies from

web to IDFA. Launched in Q1 2018 with 25% coverage" (GOOG-RDGZ-00193001 at -006).

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# Appendix A-13

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**UNITED STATES DISTRICT COURT**

**NORTHERN DISTRICT OF CALIFORNIA**

**SAN FRANCISCO**

| | |
|---|---|
| ANIBAL RODRIGUEZ AND JULIE ANNA MUNIZ, individually and on behalf of all other similarly situated, <br><br> Plaintiff, <br><br> vs. <br><br> GOOGLE LLC, *et al.*, <br><br> Defendant. | Case No.  3:20-CV-04688  RS <br><br> **DEFENDANT GOOGLE LLC'S FOURTH SUPPLEMENTAL RESPONSES AND OBJECTIONS TO PLAINTIFFS' INTERROGATORIES, SET ONE** <br><br> Judge:     Hon. Richard Seeborg <br> Courtroom:  3, 17th Floor <br> Action Filed:  July 14, 2020 |

PROPOUNDING PARTY:  PLAINTIFFS ANIBAL RODRIGUEZ AND JULIEANNA MUNIZ

RESPONDING PARTY:  DEFENDANT GOOGLE LLC

SET NO.:      ONE

1    on that Google data collection, (c) what impact if any an app's disabling of analytics data

2    collection has on that Google data collection, and (d) what impact if any an app's decision to use

3    or not use any Google services apart from Firebase SDK has on that Google data collection.

4    **RESPONSE TO INTERROGATORY NO. 1:**

5         Google objects to Interrogatory No. 1 as vague and ambiguous as to the undefined term

6    "Web & App Activity." For purposes of this response, Google construes Web & App Activity to

7    mean the account-level setting called Web & App Activity. Google further objects to this

8    Interrogatory as vague and ambiguous with respect to the phrases "Google's data collection,"

9    "impact" and "Firebase SDK." Google further objects that the definition of "Class Period" is

10   vague and ambiguous, as the Interrogatory defines the term to mean "the class period in this case,

11   as defined in the operative complaint," when the "operative complaint" has changed between

12   when the Interrogatories were served and when these responses were provided, and the definition

13   of "Class Period" differs between the original and amended complaints. Google further objects

14   that the term "Class Period" is vague and ambiguous because it fails to provide a concrete range of

15   time. Google further objects to this Interrogatory to the extent that it seeks information protected

16   by the attorney-client privilege and/or the attorney work product doctrine. Google further objects

17   to this Interrogatory as unduly burdensome, overbroad, and disproportionate to the needs of the

18   Action because this Interrogatory seeks information outside of the Class Period, which has little to

19   no bearing on Plaintiffs' claims.

20        Subject to and without waiving the foregoing objections, Google responds as follows: The

21   type of information that can be collected through the Google Analytics for Firebase default

22   implementation, if authorized by an entity that uses Google Analytics for Firebase, includes:

23   (1) number of users and sessions, (2) first launches, (3) in-app purchases, (4) session duration,

24   (5) screen views, (6) app updates, (7) operating system updates and (8) uninstalls. If an entity

25   chooses to use Google Analytics for Firebase, it authorizes that the following parameters are

26   collected by default with every event that is collected either by default or manually, as instructed

27   by the app developer: (1) screen information, and (2) session information. Further, if an entity

28   chooses to use Google Analytics for Firebase, it authorizes the following automatically-collected

4

GOOGLE LLC'S FOURTH SUPPLEMENTAL RESPONSES AND OBJECTIONS TO PLAINTIFFS'
INTERROGATORIES, SET ONE
Case No. 3:20-CV-04688 RS

HIGHLY CONFIDENTIAL – ATTORNEYS' EYES ONLY

1     device-related dimensions: (1) operating system, (2) device model, (3) language, (4) app store,

2     (5) app version, and (6) first launch time. Web & App activity is an account-level setting that

3     functions independently from Google Analytics for Firebase. Accordingly, a user turning off Web

4     & App Activity does not prevent apps from collecting data via Google Analytics for Firebase,

5     which is a separate product that apps may choose to utilize to collect and analyze their own users'

6     data.

7     **SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 1:**

8     Subject to and without waiving the foregoing objections, Google responds further as

9     follows: Since its launch, Google Analytics for Firebase has collected the following types of

10     information by default, if Google Analytics for Firebase was enabled by an app developer using

11     the Firebase SDK: (1) number of users and sessions, (2) first launches, (3) in-app purchases,

12     (4) session duration, (5) app updates, (6) operating system updates and (7) uninstalls. As of

13     October 24, 2016, Google Analytics for Firebase has also collected screen views. If an entity

14     chooses to use Google Analytics for Firebase, it authorizes that the following parameters are

15     collected by default with every event that is collected either by default or manually, as instructed

16     by the app developer: (1) screen information, and (2) session information. Google Analytics for

17     Firebase has collected these parameters by default since its launch. Further, if an entity chooses to

18     use Google Analytics for Firebase, it authorizes the following automatically-collected device-

19     related dimensions: (1) operating system, (2) device model, (3) language, (4) app store, (5) app

20     version, and (6) first launch time. Google Analytics for Firebase has automatically collected these

21     device-related dimensions since its launch.

22     Web & App activity is an account-level setting that functions independently from Google

23     Analytics for Firebase. Accordingly, a user turning off Web & App Activity does not prevent

24     apps from collecting data via Google Analytics for Firebase, which is a separate product that apps

25     may choose to utilize to collect and analyze their own users' data. The data logged by Google

26     Analytics for Firebase in its default implementation are not collected if a developer has not

27     enabled Google Analytics for Firebase. There are other products and features that are part of

28     Firebase SDK that may collect overlapping pieces of data, such as device model, app updates, and

1   other types of data, but all such functionality is publicly documented and intentionally

2   implemented by app developers. Each such product and feature, none of which are implicated by

3   the First Amended Complaint, separately obtain consent and publicly disclose their functionality.

4           Finally, footnote 13 of the First Amended Complaint cites

5   https://firebase.google.com/docs/app-indexing/android/log-actions, which is a webpage dealing

6   with a separate Firebase SDK product called "App Indexing." As the cited webpage notes, App

7   Indexing cannot collect event data unless certain conditions are met, including that a user has

8   turned their Web & App Activity Control to "on."

9   **SECOND SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 1:**

10          Subject to and without waiving the foregoing objections, Google responds further as

11  follows:

12          Google carefully processes information it receives from app developers via Google

13  Analytics for Firebase ("GA for Firebase"). As explained herein, entities that choose to use GA

14  for Firebase must incorporate it into their apps, enable its function, and thereby cause it to begin

15  logging event data that is subsequently uploaded to Google servers for analysis and reporting.

16  Google takes measures to process event data sent to Google via GA for Firebase according to the

17  type of consent each user gives. For example, Google runs consent checks on the data during

18  several processing steps, and it only associates event data with a specific user when the user has

19  consented to that, including by having the WAA control turned to "on." When consent is lacking,

20  Google takes several sophisticated technological steps to ensure that event data cannot be

21  associated with a specific user, including by imposing several technological barriers to what is

22  known as unauthorized "joining" of logs together to de-anonymize users. Unauthorized joining is

23  forbidden, and Google also takes several steps to ensure access to the logs in question is restricted.

24  Google does not join user event data collected via GA for Firebase to re-identify anonymized data.

25  Google's customers are likewise never given access to data that could be used to de-anonymize

26  users.

27           Plaintiffs' First Amended Complaint cites and quotes public documentation about GA for

28  Firebase to demonstrate the types of user app interaction data, or "event data" that Plaintiffs allege

1    Google is improperly collecting. In order for the data collection described in each of those pieces

2    of documentation to occur, an app developer must enable GA for Firebase. If app developers don't

3    enable GA for Firebase, the data that would otherwise be sent to Google servers by GA for

4    Firebase isn't sent to Google servers. Google doesn't implement in Firebase SDK any "shadow"

5    copy of GA for Firebase that operates regardless of whether a developer has enabled GA for

6    Firebase, nor does Google has any "secret scripts" that ignore the consent settings of users in order

7    to connect event data to specific users' profiles. GA for Firebase will not store event data

8    connected to a specific user's profile unless the app has permitted it and a user has opted into

9    certain features, namely: the supplemental checkbox under the WAA control (sWAA), which can

10   only be turned on if WAA is also turned on; Google Ads Personalization (GAP); and the

11   supplemental checkbox under the GAP control (NAC). Finally, based on a reasonable

12   investigation, Google has been unable to identify any impact an app's decision to use or not use a

13   Google product or service other than Firebase SDK would have on the functioning of GA for

14   Firebase as described below.

15        With regard to the other products and features that are part of Firebase SDK that may

16   collect overlapping pieces of data, such as device model, app updates, and other types of data,

17   such functionality is publicly documented including on Google's public help center pages at

18   GOOG-RDGZ-00013288 - GOOG-RDGZ-00013449, which can also be viewed at

19   firebase.google.com and support.google.com.

20   **THIRD SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 1:**

21        Subject to and without waiving the foregoing objections, Google responds further as

22   follows:

23        Google carefully processes information it receives from app developers via Google

24   Analytics for Firebase ("GA for Firebase"). As explained herein, entities that choose to use GA

25   for Firebase must incorporate it into their apps, enable its function, and thereby cause it to begin

26   logging event data that is subsequently uploaded to Google servers for analysis and reporting.

27   Google takes measures to process event data sent to Google via GA for Firebase according to the

28   type of consent each user gives. For example, Google runs consent checks on the data during

1  several processing steps, and it only associates event data with a specific user when the user has

2  consented to that, including by having the WAA control turned to "on." When consent is lacking,

3  Google takes several sophisticated technological steps to ensure that event data cannot be

4  associated with a specific user, including by imposing several technological barriers to what is

5  known as unauthorized "joining" of logs together to de-anonymize users. Unauthorized joining is

6  forbidden, and Google also takes several steps to ensure access to the logs in question is restricted.

7  Google does not join user event data collected via GA for Firebase to re-identify anonymized data.

8  Google's customers are likewise never given access to data that could be used to de-anonymize

9  users.

10      Plaintiffs' First Amended Complaint cites and quotes public documentation about GA for

11  Firebase to demonstrate the types of user app interaction data, or "event data" that Plaintiffs allege

12  Google is improperly collecting. In order for the data collection described in each of those pieces

13  of documentation to occur, an app developer must enable GA for Firebase. If app developers don't

14  enable GA for Firebase, the data that would otherwise be sent to Google servers by GA for

15  Firebase isn't sent to Google servers. Google doesn't implement in Firebase SDK any "shadow"

16  copy of GA for Firebase that operates regardless of whether a developer has enabled GA for

17  Firebase, nor does Google has any "secret scripts" that ignore the consent settings of users in order

18  to connect event data to specific users' profiles. GA for Firebase will not store event data

19  connected to a specific user's profile unless the app has permitted it and a user has opted into

20  certain features, namely: the supplemental checkbox under the WAA control (sWAA), which can

21  only be turned on if WAA is also turned on; Google Ads Personalization (GAP); and the

22  supplemental checkbox under the GAP control (NAC). Finally, based on a reasonable

23  investigation, Google has been unable to identify any impact an app's decision to use or not use a

24  Google product or service other than Firebase SDK would have on the functioning of GA for

25  Firebase as described below.

26

27

28

At a high level, the data flow of event data associated with GA for Firebase can be thought of conceptually as follows:

```
┌──────────────────┐     ┌──────────────────────────┐     ┌──────────────────────────┐
│ App interaction  │     │ Consent Checks           │     │ (if consent checks       │
│ data generated   │     │ -packet duplication      │     │ are positive):           │
│ by user          │     │ -check for user consent, │     │ GAIA short term          │
│ interacting with │ ──► │ including check for WAA  │ ──► │ logs (56-day             │
│ app that has     │     │ turned "on"              │     │ retention)               │
│ GA for           │     │ -check for app developer │     └──────────────────────────┘
│ Firebase         │     │ consent                  │                    │
│ enabled          │     │ -make data "fuzzy" to    │                    ▼
└──────────────────┘     │ prevent joining          │     ┌──────────────────────────┐
         │               └──────────────────────────┘     │ GAIA data                │
         ▼                            │                    │ retention                │
┌──────────────────┐                  ▼                    │ (months)                 │
│ Data Bundle      │     ┌──────────────────────────┐     └──────────────────────────┘
│ -Event data      │     │ Pseudonymous short       │
│ -DSID/IDFA (for  │     │ term logs (56-day        │
│  consent)        │     │ retention)               │
│ -IDs for logging │     └──────────────────────────┘
│ -User properties │                    │
│  (optional)      │                    ▼
└──────────────────┘     ┌──────────────────────────┐
                         │ Pseudonymized            │
                         │ aggregated logs for      │
                         │ customers                │
                         │ (retention set by        │
                         │ customers)               │
                         └──────────────────────────┘
```

Each of these steps is discussed in further detail below.

### 1. Data Logging

When app developers enable GA for Firebase, code authored by Google and activated by developers logs certain user interaction events automatically, such as the first opening of an app or when a user clicks on a certain part of the app. *See generally* https://support.google.com/firebase/answer/9234069?hl=en.

GA for Firebase on Android also logs: **DSID** (if the developer permits it, *e.g.*, if Google Signals is enabled for the Google Analytics property), which makes it possible to check against a specific user's privacy settings to ensure consent is provided; and **adid**, or "Ad ID," which is used for advertising purposes under certain circumstances as described more fully below.[1] On iOS, GA for Firebase logs **IDFA**, or "Identifier for Advertiser," which is the rough equivalent of the Ad ID on Android.

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[1] *See* https://www.google.com/url?q=https://firebase.google.com/docs/analytics/configure-data-collection?platform%3Dandroid&sa=D&source=editors&ust=1623176595924000&usg=AOvVaw2T8Y_BUbEk1Od-0SpMEX0d.

1    GA for Firebase also logs the device's ads personalization opt-out setting: "opt-out of ads

2    personalization, or OOOAP for Android and "limit ad tracking," or LAT for iOS.

3    GA for Firebase also logs a unique **app_instance_id**, which identifies the app session of

4    the particular app running on a particular device. app_instance_id is not persistent; it can be

5    refreshed when users take certain actions such as re-installing apps, certain updates to apps, and

6    other similar actions.

7    Finally, for ads interactions, GA for Firebase also logs **aeid**, or "Ad Event ID," which is a

8    unique identifier for the specific ad interaction logged in order to enable integration between GA

9    for Firebase and AdMob if the customer has linked their AdMob app to Google Analytics.

10    This logging occurs at the same time as the interactions that trigger the event. For example,

11    when a user clicks a specific button that the app developer has chosen to track using GA for

12    Firebase, that button click is logged as it occurs. It is typically not uploaded to Google servers

13    until later.

14    **2.   Data Upload**

15    Apps with GA for Firebase enabled log and send information to Google via GA for

16    Firebase code in a packet sometimes referred to as a "HitBundle." These packets contain (1)

17    event information including app_instance_id, (2) DSID/IDFA for consent checks, and (3) non-

18    personally identifiable information (PII) for user properties (if the app developer chooses to

19    include such data). A HitBundle can contain multiple events grouped together. Event information

20    includes different types of user-interaction data, as discussed above. The predefined and

21    recommended events and user properties are publicly defined by Google. User properties are

22    slowly changing data that describe the device or user of the device that an app developer may

23    send, but it cannot send PII.

24    All of the HitBundle data is sent to Google in a single transmission. In other words, the

25    app-interaction event data and user properties are sent to Google in the same packet as the

26    DSID/IDFA, which is the information that allows Google to run consent checks.

27    For Android apps with Google Play Services enabled, GA for Firebase data is collected

28    from all apps into a central file called app_measurement.db, which is periodically uploaded to

1  Google's servers. Google does this because it saves battery for users, whose devices would

2  otherwise be initiating more uploads every day. On iOS devices, this is not possible, so each GA-

3  for-Firebase-enabled app periodically transmits the data to Google's servers individually.

4       In all cases, data is first logged by GA for Firebase, recorded on the user's device in the

5  appropriate file, and then subsequently uploaded to Google servers.

6       **3.  Consent Checks and Technical Barriers to Joining**

7       HitBundles are received by Google at a "collection endpoint," where the data is stored in

8  short-term memory. Before any data is ever written to disk, the server completes several important

9  steps designed to protect user privacy. The first step is to check if the customer has enabled

10  Google Signals. Everything described below regarding data duplication and consent checks is

11  gated on whether the customer has enabled Google Signals. If the customer hasn't enabled Google

12  Signals, the HitBundle is treated purely pseudonymously.

13       A preliminary step before the consent check occurs is data duplication.  A single copy of

14  the data packet received from a user's mobile device is made. This is done to facilitate the

15  eventual data logging that respects user consent choices.  One copy could become tied to a user's

16  account if consent checks permit it; the other will become a pseudonymous log.  During this time

17  period, the copies are stored in short-term memory. The time between receipt and logging is

18  typically less than five minutes.

19       Then, Google checks to see if a user is signed into their Google Account and whether they

20  have opted into certain privacy controls, namely: the supplemental checkbox under the WAA

21  control (sWAA), which can only be turned on if WAA is also turned on; Google Ads

22  Personalization (GAP); and the supplemental checkbox under the GAP control (NAC). Each of

23  WAA, sWAA, GAP, and NAC are account-level Web & App Activity and Ads Personalization

24  controls. If sWAA, GAP, and NAC are all turned on, the result of the consent check is that the

25  data can be tied to a user's Google account in what is known as "GAIA space." If any of these

26  controls are off, then the data isn't joined to a user's Google account, and therefore not logged in

27  "GAIA space."

28

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1    The consent check actually happens in several steps, all in short-term memory, before any

2    data is written to disk, *i.e.*, stored: (a) data is received at Google's servers and, if Google Signals is

3    enabled, it is duplicated to facilitate logging; (b) Google uses a server to check whether a user is

4    logged into a Google Account and whether consent has been given to join data to the account (the

5    sWAA, GAP, and NAC settings discussed above); and (c) the data sets are cleaned and some data

6    is regenerated to add additional obstacles to joining data.

7    To do this check, Google uses a DSID (IDFA on iOS). It tells Google who the user is by

8    checking the DSID, which is an encrypted GAIA identifier. There will be no DSID in the

9    HitBundle if the user is not signed into a Google Account. On iOS devices, the IDFA is associated

10   with GAIA when users have logged into their Google Account and have not limited ad tracking.

11   Google also checks to make sure the app developer consents to the tying of GA for Firebase data

12   to users' accounts.[2]

13   Importantly, the Google server that receives the HitBundle, called ████, cannot decrypt

14   the DSID. This is by design. Instead, ████ must send the encrypted DSID to a different Google

15   server that performs the consent check and then returns to ████ either a "no consent" signal, or an

16   encrypted GAIA ID. As a result, the hit bundles in short term memory on the ████ server cannot

17   reflect a user's identity until a "yes consent" signal is received from a different server, which itself

18   never receives the measurement data logged by GA for Firebase. All of this occurs in short term

19   memory. The upshot of this is that the physical machine that receives the encrypted DSID from

20   user devices isn't able to decrypt it, and the physical machine that decrypts the DSID doesn't

21   receive the measurement data, it only gets the fields that can be used to check identity. This is all

22   done to make it even less possible that a bad actor could infiltrate Google's system and perform an

23   unauthorized "join."

24

25

26   [2] *See*
https://www.google.com/url?q=https://support.google.com/analytics/answer/7532985?hl%3Den%

27   23zippy%3D%252Cin-this-
article&sa=D&source=editors&ust=1623176595926000&usg=AOvVaw1v59Uqg6gqH_XGgl4Z7

28   6xO.

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1    If any aspect of the consent check fails, the user data is not stored in GAIA space, and the

2    DSIS/IDFA is deleted.

3    After the consent check is completed and data is duplicated into two logs, Google removes

4    data from each log to prevent "joining," which is a technical term that refers to re-identifying

5    pseudonymized users by joining data from disparate parts of data held by Google together.

6    Google takes a number of steps throughout its organization to prevent unauthorized joining of user

7    data, and employees are, generally speaking, barred from doing it. Encryption is used to prevent

8    Google personnel from identifying the data without authorization. Decryption keys are tightly

9    controlled, and destroyed after a set period of time, making it impossible to re-join the data.

10    From the signed-in GAIA copy of data, Google removes all pseudonymous identifiers.

11    From the signed-out pseudonymous log, Google removes all signed-in identifiers. The result is

12    that the two logs don't overlap identifiers that could be used to join the logs together.

13    Google additionally regenerates data to prevent deterministic joining. A "deterministic"

14    or "probabilistic" join would allow a complicated algorithm to use brute force and probability to

15    guess which data belongs to which person. While the data is still in short term memory, Google

16    creates "fuzziness," or slight errors, in data to prevent this. For example, Google adds random

17    error into timestamps so they can't be matched together with timestamps elsewhere.

18    **4. Differentiated Logging**

19    Pseudonymous short-term logs have a 56-day retention period. They store the

20    pseudonymized copy of the user interaction data—that is, they don't contain any identifying

21    information, so it's not possible to tell to which user the event data belongs. They are used to

22    create aggregated event data logs for customer use. GAIA short-term logs contain the same event

23    data but keyed to a specific user.

24    To ensure that joining is practically impossible, Google takes several steps to scrub these

25    logs of data that overlaps with data in other logs. Pseudonymous logs don't contain GAIA IDs.

26    GAIA logs don't contain Device ID or app_instance_id. Both logs do contain aeid, or Ad Event

27    ID, but in the pseudonymous log, aeid is encrypted with a 6-day retention key that is different

28    from the encryption key used to encrypt Ad Event ID in GAIA logs. Further, in GAIA logs, aeid is

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1    "salted" as well, meaning random data is added to it to make it even harder to match it to the aeid

2    stored in pseudonymous logs. As a practical matter, connecting these to each other is impossible.

3        **5.  Google's Encryption Technology**

4        As further background, Google's encryption technology creates new encrypted keys every

5    day. This enables the encryption keys to be retained for a fixed period (for example 60 days) of

6    time for decryption purposes. Once the period of time passes, the keys are deleted, making

7    decryption impossible. GA for Firebase also uses a different encryption key for the same user ID

8    in GAIA space as compared to pseudonymous space (and in the case of aeid, in AdMob

9    space). For that reason, it is prohibitively expensive to decrypt data from one log (e.g.,

10   pseudonymous) and join the data with another log.

11       For a set period of time, some IDs (device ID, app instance ID, and ad event ID) are stored

12   and encrypted to allow Google to account for possible delays in data transmission and to fix any

13   errors in data processing, including at customers' (i.e., app developers') request.

14       *Device ID and app-instance ID* are stored in encrypted form for 60 days. The reason the

15   keys are stored for 60 days is because there are sometimes errors in the logs that require

16   reprocessing of data. The 60-day window allows for customers to request reprocessing. It also

17   allows Google to scan the logs to determine the amount of data affected by errors, which informs

18   solutions to code issues. Google personnel are barred from using these keys without authorization,

19   Google has monitors in place to ensure such unauthorized use doesn't happen, and access to the

20   keys is tightly controlled. As a general matter, humans who work for Google would have no

21   reason to gain access to these keys, and they don't. Computers do use them to reprocess data, as

22   described here, but this happens without humans learning the keys, not unlike swiping a credit

23   card at a grocery store.

24       *Ad event IDs* are stored in encrypted form for 6 days. These IDs are specific to a user's

25   particular interaction with an ad. Ad event IDs allow Google to expand the Google Analytics

26   pseudonymous data set with data from ADMob logs *if* the user has provided the proper

27   permissions. Where a user interacts with a product that uses AdMob, that interaction is stored in

28   AdMob logs and that data is joined to the Analytics data set using the ad-event ID.

1    The encryption keys are retained for 6 days to allow for processing time and errors. The

2    processing happens daily and in some cases takes a few hours. If reprocessing of the data is

3    necessary due to some error, the 6-day window allows Google time to do the reprocessing.

4        As discussed above, the ad event ID is the only unique ID common to both GAIA space

5    and signed-out space that would allow for joining of data to a specific user. This means that for

6    the 6-day window in which the ad event ID is stored with encryption, it is theoretically possible

7    for someone with access to both ad event ID encryption keys to join data.

8        Google takes several steps to ensure this does not happen. As described above, Google

9    generates new encryption keys each day and it uses a different key for the same user ad event ID

10    in GAIA space as compared to pseudonymous space. Access to the encryption keys is tightly

11    controlled and even the teams of engineers that create the code for GA for Firebase and related

12    products/services do not have access to the keys. Google also protects the code that requires use

13    of encryption keys. Once the 6-day period has elapsed, it is not possible for Google (or any other

14    bad actor) to rejoin data stored in the pseudonymous logs with a user profile using the ad event ID.

15        Further, Google uses a restricted need-based access process and audit procedure. To begin,

16    Google supports tiered access to the logs stored by GA for Firebase. None of the tiers includes

17    personally identifiable information, but the default access level, for example, includes only event

18    data, so Google employees cannot see any identifiers at all. Querying a log past the default state

19    (i.e., geolocation logs or raw logs) requires a request ticket that allows Google to audit and track

20    the request. Through that system, teams have to explain why they need a specific level of beyond-

21    default access. Even if such access is granted, Google does not allow access forever. There are

22    temporal restrictions: access is granted for a certain time frame after which teams will need to re-

23    request access.

24    **6. Use of User Data by Customers**

25        User data is made available to external customers from whom the data originally was

26    transmitted so they can conduct analytics and other marketing campaigns.

27        When data is reported to app developers, it is done so on an aggregated level. After

28    pseudonymous logs are created, a subset of the data in them is then used to create the database for

1    the back-end of GA for Firebase that feeds customers with aggregated reports. None of the ID data

2    in that database overlaps with data in GAIA space, so no joining between them is possible. Both

3    datasets do include event data, however, though timestamps are made "fuzzy" to prevent joining,

4    as discussed above.

5        **7. Use of Pseudonymous User Data by Google**

6        Google uses user data collected via GA for Firebase across teams for product development,

7    improvement, and diagnostics. As discussed above, if a user has provided consent, and if the

8    AdMob and GA for Firebase Administrators at the customer have linked their AdMob account to

9    their GA for Firebase app, Google can also join event data from GA for Firebase logs with

10   AdMob log data in order to target advertising to users, all without personally identifying the user.

11       With regard to the other products and features that are part of Firebase SDK that may

12   collect overlapping pieces of data, such as device model, app updates, and other types of data,

13   such functionality is publicly documented including on Google's public help center pages at

14   GOOG-RDGZ-00013288 - GOOG-RDGZ-00013449, which can also be viewed at

15   firebase.google.com and support.google.com.

16   **FOURTH SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 1:**

17       Subject to and without waiving the foregoing, and without waiving any claim of privilege

18   or protection of the work product doctrine, Google further responds as follows:

19       Google carefully processes information it receives from app developers via Google

20   Analytics for Firebase ("GA for Firebase"). As explained herein, entities that choose to use GA

21   for Firebase must incorporate it into their apps, enable its function, and thereby cause it to begin

22   logging event data that is subsequently uploaded to Google servers for analysis and reporting.

23   Google takes measures to process event data sent to Google via GA for Firebase according to the

24   type of consent each user gives. For example, Google runs consent checks on the data during

25   several processing steps, and it only associates event data with a specific user when the user has

26   consented to that, including by having the WAA control turned to "on." When consent is lacking,

27   Google takes several sophisticated technological steps to ensure that event data cannot be

28   associated with a specific user, including by imposing several technological barriers to what is

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known as unauthorized "joining" of logs together to de-anonymize users. Unauthorized joining is forbidden, and Google also takes several steps to ensure access to the logs in question is restricted. Google does not join user event data collected via GA for Firebase to re-identify anonymized data. Google's customers are likewise never given access to data that could be used to de-anonymize users.

Plaintiffs' First Amended Complaint cites and quotes public documentation about GA for Firebase to demonstrate the types of user app interaction data, or "event data" that Plaintiffs allege Google is improperly collecting. In order for the data collection described in each of those pieces of documentation to occur, an app developer must enable GA for Firebase. If app developers don't enable GA for Firebase, the data that would otherwise be sent to Google servers by GA for Firebase isn't sent to Google servers. Google doesn't implement in Firebase SDK any "shadow" copy of GA for Firebase that operates regardless of whether a developer has enabled GA for Firebase, nor does Google has any "secret scripts" that ignore the consent settings of users in order to connect event data to specific users' profiles. GA for Firebase will not store event data connected to a specific user's profile unless the app has permitted it and a user has opted into certain features, namely: the supplemental checkbox under the WAA control (sWAA), which can only be turned on if WAA is also turned on; Google Ads Personalization (GAP); and the supplemental checkbox under the GAP control (NAC). Finally, based on a reasonable investigation, Google has been unable to identify any impact an app's decision to use or not use a Google product or service other than Firebase SDK would have on the functioning of GA for Firebase as described below.

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At a high level, the data flow of event data associated with GA for Firebase can be thought of conceptually as follows:



Each of these steps is discussed in further detail below.

### 1. Data Logging

When app developers enable GA for Firebase, code authored by Google and activated by developers logs certain user interaction events automatically, such as the first opening of an app or when a user clicks on a certain part of the app. *See generally* https://support.google.com/firebase/answer/9234069?hl=en.

GA for Firebase on Android also logs: **DSID** (if the developer permits it, *e.g.*, if Google Signals is enabled for the Google Analytics property), which makes it possible to check against a specific user's privacy settings to ensure consent is provided; and **adid**, or "Ad ID," which is used for advertising purposes under certain circumstances as described more fully below.[3] On iOS, GA for Firebase logs **IDFA**, or "Identifier for Advertiser," which is the rough equivalent of the Ad ID on Android.

GA for Firebase also logs the device's ads personalization opt-out setting: "opt-out of ads personalization, or OOOAP for Android and "limit ad tracking," or LAT for iOS.

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[3] *See* https://www.google.com/url?q=https://firebase.google.com/docs/analytics/configure-data-collection?platform%3Dandroid&sa=D&source=editors&ust=1623176595924000&usg=AOvVaw2T8Y_BUbEk1Od-0SpMEX0d.

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1    GA for Firebase customers can also choose to disable personalized advertising for the

2    whole app, geographic regions, specific users, or specific events or user properties.[4]

3    GA for Firebase also logs a unique **app_instance_id**, which identifies the app session of

4    the particular app running on a particular device. app_instance_id is not persistent; it can be

5    refreshed when users take certain actions such as re-installing apps, certain updates to apps, and

6    other similar actions. It is also refreshed automatically when customers reset their advertising

7    identifier.

8    Finally, for ads interactions, GA for Firebase also logs **aeid**, or "Ad Event ID," which is a

9    unique identifier for the specific ad interaction logged in order to enable integration between GA

10   for Firebase and AdMob if the customer has linked their AdMob app to Google Analytics.

11   Event-logging occurs at the same time as the interactions that trigger the event. For

12   example, when a user clicks a specific button that the app developer has chosen to track using GA

13   for Firebase, that button click is logged as it occurs. It is typically not uploaded to Google servers

14   until later.

15   **2.  Data Logging Technical Details**

16   A comprehensive list of measurement data collected by Google Analytics for Firebase is

17   here. Measurement data collected for Google Analytics for Firebase includes:

18   - IDFA/IDFV (on iOS); adid (on Android) as well as the LAT setting

19   - app_instance_id, which is a randomly generated identifier (UUID) on a device

20      for a given app (plays a similar role to a first party cookie on the web)

21   - app_id, aka bundle_id (on iOS) and package_id (on Android)

22   - hash of developer cert (if applicable for the mobile platform)

23   - IP address (for geo lookup)

24   - information about the OS, OS version and device information

25   - First launch events, including timestamp of the first launch

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[4] *See* https://support.google.com/analytics/answer/9626162?hl=en.

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1    ● In App Purchase events, including timestamp of the event, transaction ID,

2    product ID, product name, price, currency code and quantity. IAP data will be

3    collected automatically on iOS. The Google Analytics customer is required to

4    link their Analytics property to Google Play to collect IAP data automatically on

5    Android.

6    ● collect referrer param string associated with the last campaign click that is

7    attributable to a conversion

8    Google Analytics for Firebase also facilitates the logging of events related to Firebase

9    Cloud Messaging (FCM). The FCM SDK logs the following events through Google Analytics for

10    Firebase, when present and enabled:

11    ● notification_receive : when the push notification was received by the app

12    ● notification_foreground : when the push notification was received by the app

13    while the app was in the foreground

14    ● notification_open : when the user chose to open the notification

15    ● notification_dismiss : when the user chose to dismiss the notification

16    While the FCM SDK does log debug messages corresponding to each of these events,

17    those logs are entirely private to the app itself and can only be accessed by the app or by the

18    developer when they have connected their debug device to their development host via USB. FCM

19    does not log corresponding events to their own server. FCM uses the Google Analytics for

20    Firebase standard means of logging events which results in these notification-related events being

21    bundled and uploaded along with all other app events. Google Analytics for Firebase is the single

22    owner and authority on the events enumerated above.

23    Each of these FCM events also logs corresponding event parameters to contextualize the

24    push notification.   These event parameters are:

25    ● gcm_message_name: the name of the message in the FCM "Message Composer"

26    UX

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1      • gcm_message_time: the time at which the developer chose to broadcast push

2         notifications. Alternatively, if the developer chose to use "device-local" time,

3         message_time indicates a delivery time relative to each device's time zone.

4      • gcm_message_use_device_time : a flag which determines the interpretation of

5         message_time.

6      • gcm_message_id: a unique ID for the message campaign

7      • gcm_sender_id: the sender ID corresponds to the developer's cloud project ID

8         These parameters correspond to fields in message campaigns launched by the GCM

9    Product on the Web. None of these parameters are associated with users or devices.

10        These events are aggregated in tables in a manner consistent with all other events.

11   Furthermore, app developers are able to send events and user properties to Google Analytics for

12   Firebase. An event has a string name, and up to 25 event parameters (name / value pairs). It

13   represents an event of interest happening inside the app on a particular device. Multiple events

14   may be batched together into multiple HitBundle. In addition to events, a HitBundle may also

15   carry user properties (name / value pairs), which are slowly changing data describing the device or

16   the user of the device. App developers should not send PII in either event names, event parameters

17   or user properties. Doing so is considered a violation of GMP TOS.

18        The app events data are joined with additional information on the server side, e.g., a

19   device's screen resolution is derived based on a device model name. GA for Firebase collects app

20   events data for mobile apps that are built with the Google Mobile Platform. The Firebase

21   Analytics SDK also facilitates the logging of events related to Firebase Crashlytics.

22        The Firebase Crashlytics SDK will log the following events through Google Analytics, if

23   present and enabled:

24        *app_exception*

25        In addition to logging this new event, Firebase Crashlytics captures the last N events that

26   are logged on the device and -- upon an exception/crash -- reports these to their own BE.

27        The Google Analytics for Firebase SDK facilitates the setting of User Properties related to

28   Firebase Cloud Messaging and Firebase Remote Config (aka Config).

1    The Firebase Cloud Messaging SDK will set the following User Property using the Google

2  Analytics API, when present and enabled:

3        firebase_last_notification (working name)

4    The Firebase Remote Config SDK will set the following User Properties using the Google

5  Analytics API:

6        firebase_experiment1_group (working_name)

7        firebase_experiment2_group (working_name)

8    The Google Analytics for Firebase SDK will collect the Instance ID (IID) for the purposes

9  of Audience List exporting to Firebase. The SDK collects this ID from the user's device and

10  includes it in the HitBundle.

11    On Android, the Google Analytics for Firebase SDK will collect the Android ID on

12  devices that do not have Google Play Services installed. Devices without Google Play Services do

13  not provide resettable_device_id (AdID).

14    The Google Analytics backend also aggregates per user cumulative metrics for Firebase

15  A/B Testing (ABT). These metrics are used by ABT backends to determine the winning variation

16  of multiple candidates. The access requirements of this data is same as all other aggregated

17  Google Analytics data.

18    Google also supports view based campaign attribution (a.k.a. VTC) in addition to click

19  from both adwords and 3rd party. If a user has not clicked on an ad previously, but has an ad view

20  then Google will attribute the conversion to the ad viewed.

21    **3.  Data Upload**

22    Apps with GA for Firebase enabled log and send information to Google via GA for

23  Firebase code in a packet sometimes referred to as a "HitBundle." These packets contain (1)

24  event information including app_instance_id, (2) DSID/IDFA for consent checks, and (3) non-

25  personally identifiable information (PII) for user properties (if the app developer chooses to

26  include such data). A HitBundle can contain multiple events grouped together. Event information

27  includes different types of user-interaction data, as discussed above. The predefined and

28  recommended events and user properties are publicly defined by Google. User properties are

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1   slowly changing data that describe the device or user of the device that an app developer may

2   send, but it cannot send PII.

3        All of the HitBundle data is sent to Google in a single transmission.  In other words, the

4   app-interaction event data and user properties are sent to Google in the same packet as the

5   DSID/IDFA, which is the information that allows Google to run consent checks.

6        For Android apps with Google Play Services enabled, GA for Firebase data is collected

7   from all apps into a central file called app_measurement.db, which is periodically uploaded to

8   Google's servers. Google does this because it saves battery and reduces network data costs for

9   users, whose devices would otherwise be initiating more uploads every day. On iOS devices, this

10  is not possible, so each GA-for-Firebase-enabled app periodically transmits the data to Google's

11  servers individually.

12       In all cases, data is first logged by GA for Firebase, recorded on the user's device in the

13  appropriate file, and then subsequently uploaded to Google servers.

14       **4.  Consent Checks and Technical Barriers to Joining**

15       HitBundles are received by Google at a "collection endpoint," where the data is stored in

16  short-term memory. Before any data is ever written to disk, the server completes several important

17  steps designed to protect user privacy. The first step is to check if the customer has enabled

18  Google Signals. Everything described below regarding data duplication and consent checks is

19  gated on whether the customer has enabled Google Signals. If the customer hasn't enabled Google

20  Signals, the HitBundle is treated purely pseudonymously.

21       A preliminary step before the consent check occurs is data duplication.  A single copy of

22  the data packet received from a user's mobile device is made. This is done to facilitate the

23  eventual data logging that respects user consent choices.  One copy could become tied to a user's

24  account if consent checks permit it; the other will become a pseudonymous log.  During this time

25  period, the copies are stored in short-term memory. The time between receipt and logging is

26  typically less than five minutes.

27       Then, Google checks to see if a user is signed into their Google Account and whether they

28  have opted into certain privacy controls, namely: the supplemental checkbox under the WAA

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1    control (sWAA), which can only be turned on if WAA is also turned on; Google Ads

2    Personalization (GAP); and the supplemental checkbox under the GAP control (NAC). Each of

3    WAA, sWAA, GAP, and NAC are account-level Web & App Activity and Ads Personalization

4    controls. If sWAA, GAP, and NAC are all turned on, the result of the consent check is that the

5    data can be tied to a user's Google account in what is known as "GAIA space." If any of these

6    controls are off, then the data isn't joined to a user's Google account, and therefore not logged in

7    "GAIA space."

8         The consent check actually happens in several steps, all in short-term memory, before any

9    data is written to disk, *i.e.*, stored: (a) data is received at Google's servers and, if Google Signals is

10   enabled, it is duplicated to facilitate logging; (b) Google uses a server to check whether a user is

11   logged into a Google Account and whether consent has been given to join data to the account (the

12   sWAA, GAP, and NAC settings discussed above); and (c) the data sets are cleaned and some data

13   is regenerated to add additional obstacles to joining data.

14        To do this check, Google uses a DSID (IDFA on iOS). It tells Google who the user is by

15   checking the DSID, which is an encrypted GAIA identifier. There will be no DSID in the

16   HitBundle if the user is not signed into a Google Account. On iOS devices, the IDFA is associated

17   with GAIA when users have logged into their Google Account and have not limited ad tracking.

18   Google also checks to make sure the app developer consents to the tying of GA for Firebase data

19   to users' accounts.[5]

20        Importantly, the Google server that receives the HitBundle, called &#9608;&#9608;&#9608;, cannot decrypt

21   the DSID. This is by design. Instead, &#9608;&#9608;&#9608; must send the encrypted DSID to a different Google

22   server that performs the consent check and then returns to &#9608;&#9608; either a "no consent" signal, or an

23   encrypted GAIA ID. As a result, the hit bundles in short term memory on the &#9608;&#9608; server cannot

24   reflect a user's identity until a "yes consent" signal is received from a different server, which itself

25

---

26   [5] *See*

27   https://www.google.com/url?q=https://support.google.com/analytics/answer/7532985?hl%3Den%23zippy%3D%252Cin-this-

28   article&sa=D&source=editors&ust=1623176595926000&usg=AOvVaw1v59Uqg6gqH_XGgl4Z76xO.

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1   never receives the measurement data logged by GA for Firebase. All of this occurs in short term

2   memory. The upshot of this is that the physical machine that receives the encrypted DSID from

3   user devices isn't able to decrypt it, and the physical machine that decrypts the DSID doesn't

4   receive the measurement data, it only gets the fields that can be used to check identity. This is all

5   done to make it even less possible that a bad actor could infiltrate Google's system and perform an

6   unauthorized "join."

7       If any aspect of the consent check fails, the user data is not stored in GAIA space, and the

8   DSIS/IDFA is deleted.

9       After the consent check is completed and data is duplicated into two logs, Google removes

10  data from each log to prevent "joining," which is a technical term that refers to re-identifying

11  pseudonymized users by joining data from disparate parts of data held by Google together.

12  Google takes a number of steps throughout its organization to prevent unauthorized joining of user

13  data, and employees are, generally speaking, barred from doing it. Encryption is used to prevent

14  Google personnel from identifying the data without authorization. Decryption keys are tightly

15  controlled, and destroyed after a set period of time, making it impossible to re-join the data.

16      From the signed-in GAIA copy of data, Google removes all pseudonymous identifiers.

17  From the signed-out pseudonymous log, Google removes all signed-in identifiers. The result is

18  that the two logs don't overlap identifiers that could be used to join the logs together.

19      Google additionally regenerates data to prevent deterministic joining.  A "deterministic"

20  or "probabilistic" join would allow a complicated algorithm to use brute force and probability to

21  guess which data belongs to which person.  While the data is still in short term memory, Google

22  creates "fuzziness," or slight errors, in data to prevent this.  For example, Google adds random

23  error into timestamps so they can't be matched together with timestamps elsewhere.

24      **5. Differentiated Logging**

25      Pseudonymous short-term logs have a 56-day retention period. They store the

26  pseudonymized copy of the user interaction data—that is, they don't contain any identifying

27  information, so it's not possible to tell to which user the event data belongs.  They are used to

28

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1    create aggregated event data logs for customer use. GAIA short-term logs contain the same event

2    data but keyed to a specific user.

3         To ensure that joining is practically impossible, Google takes several steps to scrub these

4    logs of data that overlaps with data in other logs. Pseudonymous logs don't contain GAIA IDs.

5    GAIA logs don't contain Device ID or app_instance_id. Both logs do contain aeid, or Ad Event

6    ID, but in the pseudonymous log, aeid is encrypted with a 6-day retention key that is different

7    from the encryption key used to encrypt Ad Event ID in GAIA logs. Further, in GAIA logs, aeid is

8    "salted" as well, meaning random data is added to it to make it even harder to match it to the aeid

9    stored in pseudonymous logs. As a practical matter, connecting these to each other is impossible.

10         **6.  Google's Encryption Technology**

11         As further background, Google's encryption technology creates new encrypted keys every

12    day. This enables the encryption keys to be retained for a fixed period (for example 60 days) of

13    time for decryption purposes. Once the period of time passes, the keys are deleted, making

14    decryption impossible. GA for Firebase also uses a different encryption key for the same user ID

15    in GAIA space as compared to pseudonymous space (and in the case of aeid, in AdMob

16    space). For that reason, it is prohibitively expensive to decrypt data from one log (e.g.,

17    pseudonymous) and join the data with another log.

18         For a set period of time, some IDs (device ID, app instance ID, and ad event ID) are stored

19    and encrypted to allow Google to account for possible delays in data transmission and to fix any

20    errors in data processing, including at customers' (i.e., app developers') request.

21         *Device ID and app-instance ID* are stored in encrypted form for 60 days. The reason the

22    keys are stored for 60 days is because there are sometimes errors in the logs that require

23    reprocessing of data. The 60-day window allows for customers to request reprocessing. It also

24    allows Google to scan the logs to determine the amount of data affected by errors, which informs

25    solutions to code issues. Google personnel are barred from using these keys without authorization,

26    Google has monitors in place to ensure such unauthorized use doesn't happen, and access to the

27    keys is tightly controlled. As a general matter, humans who work for Google would have no

28    reason to gain access to these keys, and they don't. Computers do use them to reprocess data, as

1  described here, but this happens without humans learning the keys, not unlike swiping a credit

2  card at a grocery store.

3      *Ad event IDs* are stored in encrypted form for 6 days. These IDs are specific to a user's

4  particular interaction with an ad. Ad event IDs allow Google to expand the Google Analytics

5  pseudonymous data set with data from ADMob logs *if* the user has provided the proper

6  permissions. Where a user interacts with a product that uses AdMob, that interaction is stored in

7  AdMob logs and that data is joined to the Analytics data set using the ad-event ID.

8      The encryption keys are retained for 6 days to allow for processing time and errors. The

9  processing happens daily and in some cases takes a few hours. If reprocessing of the data is

10  necessary due to some error, the 6-day window allows Google time to do the reprocessing.

11      As discussed above, the ad event ID is the only unique ID common to both GAIA space

12  and signed-out space that would allow for joining of data to a specific user. This means that for

13  the 6-day window in which the ad event ID is stored with encryption, it is theoretically possible

14  for someone with access to both ad event ID encryption keys to join data.

15      Google takes several steps to ensure this does not happen. As described above, Google

16  generates new encryption keys each day and it uses a different key for the same user ad event ID

17  in GAIA space as compared to pseudonymous space. Access to the encryption keys is tightly

18  controlled and even the teams of engineers that create the code for GA for Firebase and related

19  products/services do not have access to the keys. Google also protects the code that requires use

20  of encryption keys. Once the 6-day period has elapsed, it is not possible for Google (or any other

21  bad actor) to rejoin data stored in the pseudonymous logs with a user profile using the ad event ID.

22      Further, Google uses a restricted need-based access process and audit procedure. To begin,

23  Google supports tiered access to the logs stored by GA for Firebase. None of the tiers includes

24  personally identifiable information, but the default access level, for example, includes only event

25  data, so Google employees cannot see any identifiers at all. Querying a log past the default state

26  (i.e., geolocation logs or raw logs) requires a request ticket that allows Google to audit and track

27  the request. Through that system, teams have to explain why they need a specific level of beyond-

28  default access. Even if such access is granted, Google does not allow access forever. There are

1    temporal restrictions: access is granted for a certain time frame after which teams will need to re-

2    request access.

3         **7.  Use of User Data by Customers**

4         User data is made available to external customers from whom the data originally was

5    transmitted so they can conduct analytics and other marketing campaigns. The measurement data

6    collected by Google Analytics for Firebase is used to provide Google customers with insights on

7    app usage and user engagement. GA for Firebase allows sharing Analytics data with Google for

8    improving Google products and services, enabling technical support, benchmarking, and sharing

9    with Account Specialists.  More on how shared data is used is here.

10         When data is reported to app developers, it is done so on an aggregated level.  After

11    pseudonymous logs are created, a subset of the data in them is then used to create the database for

12    the back-end of GA for Firebase that feeds customers with reports. None of the ID data in that

13    database overlaps with data in GAIA space, so no joining between them is possible.  Both datasets

14    do include event data, however, though timestamps are made "fuzzy" to prevent joining, as

15    discussed above.

16         Raw event data may be exported to BigQuery for custom analysis.  Google Data Studio

17    can leverage raw Analytics event data through its BigQuery connector, which facilitates the

18    generation of custom reports using Analytics events, parameters and user properties.

19         Users can adjust their data sharing settings in the Analytics Settings section in the

20    Analytics UI.

21         Google only collects measurement data for apps that have the GA for Firebase SDK built

22    in. Google's customers can obtain consent from end users to collect data. GA for Firebase

23    customers can opt out of data collection according to the mechanisms discussed here.

24         **8.  Use of Pseudonymous User Data by Google**

25         Subject to the data sharing setting "Share with Google to improve products and services,"

26    Google uses user data collected via GA for Firebase across teams for product development,

27    improvement, and diagnostics.  As discussed above, Google can also use pseudonymous event data

28    from GA for Firebase logs to target advertising to users, all without personally identifying the

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1    user. Users can opt out of such ad targeting on their device by opting out of ad tracking on their

2    Android or iOS device.

3    With regard to the other products and features that are part of Firebase SDK that may

4    collect overlapping pieces of data, such as device model, app updates, and other types of data,

5    such functionality is publicly documented including on Google's public help center pages at

6    GOOG-RDGZ-00013288 - GOOG-RDGZ-00013449, which can also be viewed at

7    firebase.google.com and support.google.com.

8    **9.  Data Storage and Access – Client-Side**

9    Analytics data is stored in sqlite database on the device. The database is private and only

10   the application has access to it. On Android Play devices the database is stored inside the GMS

11   core services (aka Google Play Services) and the application doesn't have read access to the

12   database. It can only use the client API to write to the database.

13   The local database stores the temporary raw events until they are uploaded to the Analytics

14   collection endpoint. On successful upload the raw events are deleted from the local database.

15   When the app fails to upload the raw events in 4 weeks data the data is discarded.

16   The local database also stores the user properties, the next sequential number for each

17   event name, the timestamp of the last logged event and last set user property and the next

18   sequential bundle index. Analytics data is uploaded in bundles that contain the current user

19   properties, set of events that happen and app/device metadata.

20   Uninstalling the app clears all Analytics data. Any queued up data for uploading from the

21   app might be uploaded after the app is uninstalled. Data queued up for uploading for more than 4

22   weeks will be discarded.

23   Uninstalling and reinstalling the app appears as a new fresh installation for Analytics. All

24   existing data from the previous installation, including app_instance_id, is deleted. Calling

25   resetAnalyticsData manually has the same effect.

26   *Measurement Processing Pipeline*

27   The Google Analytics for Firebase pipeline can be broken down into multiple components:

28   event ingestion, event widening, event processing, aggregation and query serving. Event ingestion

### 11. Data Deletion

Analytics Measurement data follow the Analytics standard retention policy. Some of the key default storage retention periods in GA for Firebase include:

- Collection logs: 8 weeks

- Event ingestion output: 4 days

- Raw baseview: 60 days

- Aggregates: Kept indefinitely

**INTERROGATORY NO. 2:**

Please identify every app that includes or has included Google's Firebase SDK since the start of the Class Period, including for each app the time period during which that app used Google's Firebase SDK and Google therefore would have received data even when users had Web & App Activity turned off (or previously paused).

**RESPONSE TO INTERROGATORY NO. 2:**

Google objects to Interrogatory No. 2 as vague and ambiguous as to the undefined term "Web & App Activity." For purposes of this response, Google construes Web & App Activity to mean the account-level setting called Web & App Activity. Google further objects to this Interrogatory as vague and ambiguous with respect to the phrases "Google therefore would have received the data" and "Firebase SDK." Google further objects that the definition of "Class Period" is vague and ambiguous, as the Interrogatories define the term to mean "the class period in this case, as defined in the operative complaint," when the "operative complaint" has changed between when the Interrogatories were served and when these responses were provided, and the definition of "Class Period" differs between the original and amended complaints. Google further objects that the term "Class Period" is vague and ambiguous because it fails to provide a concrete range of time. Google further objects to this Interrogatory to the extent that it seeks information protected by the attorney-client privilege and/or the attorney work product doctrine. Google further objects to this Interrogatory because it is unduly burdensome, overbroad, and disproportionate to the needs of the Action, as it seeks a list of every app that includes or has

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# Appendix A-14

# App Attribution in GAA

go/apps-in-gaa
PRD: 06/2020; author: chuyi

## Background

App campaigns are a type of campaign, like Search or Video campaigns. These campaigns are typically run by app developers to drive conversions such as installs or in-app engagement. The ads these campaigns run can appear in search results, in Gmail, on the Play store, the GDA network, or YouTube, or even within other apps.

App attribution is a bit different from web attribution. In place of cookies or image pixel tags are SDK[1] identifiers, advertising IDs[2], referrers[3], click data, and other information. Since users engage with apps over a period of time, there's also added emphasis on lifetime value when it comes to app attribution.

Our thinking on app attribution is still evolving. For the perspective of the App ads team, refer to this PRD or this strategy deck. See here for detailed notes around bringing apps to Google Ads Attribution (GAA) and here for a design doc around app attribution in ▆▆▆▆▆▆

For an engineering view of the requirements, see here.

## Objective

Broadly, our goal is to offer consistent and compelling attribution features in Google Analytics and Google Ads to app-developer advertisers.

In the next year, we want to support multi-touch attribution (MTA) for app conversions in Google Analytics and Google Ads. Today, attribution in these two platforms is last-click based.

This means we'll need to expand Google Ads Attribution's support of conversion types beyond website conversions[4] to cover app conversions. Though the majority of app conversions flow through third-parties (3Ps), our discussions here primarily focus on first-party (1P) data, meaning conversions tracked by our own Firebase SDK (also known as GA4F SDK) and imported from Google Analytics.

---

[1] SDK stands for Software Development Kit, an installable package that provides tools and libraries for developers to write code more easily.

[2] IDFA on iOS, ADID on Android. These are unique and device-specific, and can be reset.

[3] Android only.

[4] Today, GAA reads website conversions from Google Ads (AWCT) and Google Analytics.

[black redaction box]

[black redaction bars]

### The user journey

1. An app developer has an app they want more people to install and engage with.

2. They buy and set up ad campaigns in Google Ads[6] that promote installs of their app and in-app actions[7]. These campaigns can be app campaigns (covered here) or generic "Appify" campaigns (e.g., Search) that deep link into apps (see here for the journey in that case).

3. In order to know if their ads are working, the developer chooses a software-development kit (SDK) and writes some code using it to track when install or in-app conversions happen.

4. The developer sets up the SDK to ping a Google Ads API each time there's a conversion. When Google Ads receives a ping, it responds with a postback containing information about the most recent Google ad interaction preceding the conversion. The SDK also does this with other platforms (e.g., Facebook) to learn about ad interactions that happen on non-Google properties.

5. The SDK, whether Firebase (Google Analytics) or another third-party App Attribution Platform (AAP), adjudicates between the ad interactions it learns about from different networks (e.g., Google Ads, Facebook, other ad networks), computes credits for each interaction, and logs these credits on its platform.

6. If the SDK determines that the last click belongs to Google Ads, it sends us a (conversion, ad interaction) tuple[8] to indicate that we get credit for the conversion. If the SDK determines we were not the last click, it'll send a ping confirming that Google Ads didn't win the last click attribution (along with additional information like what other ad platform received credit or what

---

[5] "Ads-preferred" refers to an attribution approach that distributes conversion credits only across Google properties.

[6] Advertisers provide assets, a target bid, and a budget, and specify geo and language targeting settings.

[7] Examples: buy coins, redeem points, make reservation, obtain quote, schedule service, open account, et al.

[8] [redacted]

---

**Commented [1]:** @msiska[redacted] This user journey seems to be ACx specific. Do we want to update it to account for appify?
_Assigned to Meng He_

**Commented [2]:** Yeah, feel free to add some suggested edits!

**Commented [3]:** I have added a session with a link to the DDA for Appify (2-pager), where the details reside.

**Commented [4]:** Thanks! Using your suggested edits, I've updated bullet #2.

To clarify, what campaign types work with Appify? Search, YT, GDA, all?

**Commented [5]:** Hey @satvik[redacted], thanks for the suggestions. Based on your suggestions, I think the point I was trying to make was getting lost, so I rewrote this to be clearer. Does this look good to you now? Thanks!
_Assigned to Satvik Chauhan_

business logic the advertiser set on the AAP side that caused Google's ad event to be ineligible
for credit).

7. ████████████████████████████████████████
████████████████████████████████████████
████████████████████████████████████████
████████████████████████████████

Here's a visual for the data flow:



**Commented [6]:** @satvik ███████ I thought this may be AAP specific; is that correct?

**Commented [7]:** most AAPs do this. Correct the language a little bit.

**Commented [8]:** Thanks! Curious: what information is contained in the "why Google Ads wasn't the last click"?

**Commented [9]:** It mostly around 1. Other network won the attribution 2. Event wasn't eligible due to advertise settings on the AAP side like windows or some other business logic.

**Commented [10]:** Thanks! Updated the language in parentheses here.

Learn more about the fundamentals of app campaigns here.

## Attribution

App attribution is complicated in part because it's fragmented. Consistent Conversion Measurement (CCM) refers to our large effort to consolidate conversion tracking and processing.

There are a variety of SDKs advertisers can choose from to track conversions[9]. Today, 80% of app conversions are tracked using non-Google SDKs. We prefer advertisers use our 1P Firebase SDK[10], as this tends to give us better data for constructing multi-touch point conversion paths. Poor conversion coverage means there are fewer conversions to tie ad interactions to and spottier attribution.

---

[9] AppsFlyer, Joust, Kochava, and Firebase are some of the bigger names.
[10] The effort to drive Firebase adoption is called ██████████.

Developers tracking conversions using the Firebase SDK can see their app conversions in the core Google Analytics reports today (Analytics' Attribution reports are expected to start showing app conversions in Q1 2021). These developers can also link Google Analytics with Google Ads to see their conversions in Ads reporting.

████████████████████████████████████████████████ However, advertisers

will need to use the Firebase SDK if they want to employ automated bidding in Google Ads.

There are four types of automated bidding[13] app developers can use to optimize for user actions: ███████████ tCPI, tCPA (the only bidding type for ACe campaigns), ████████. The ones with *s are in beta.

Side note: Analytics is a wrapper around the Firebase development platform. App conversions tracked by Firebase SDKs are sometimes referred to as Firebase conversions.

Since conversions are most frequently defined as an app install or some form of in-app engagement (e.g., a sign-up or purchase), app campaigns are categorized as App Campaigns for Installs (ACi) or App Campaigns for Engagement (ACe)[14]. These are known as sub-campaign types. ACi campaigns always lead to an app store, and ACe campaigns open the app (or fallback to the app store if the app is not installed[15]).

There are three types of conversions[16].

---

[11] Google Analytics today and going forward will only support its own Firebase SDK. This is part of the ███ strategy.

[12] This is described in the user journey section above.

[13]
https://docs.google.com/presentation/d/1e34wkeWcB73B9u0gTvWk7nSwdZvrZLw0HCLMBBl1Ugk/edit?hl=en#slide=id.g8c3be08af5_0_2567

[14] There is also ACPre, a sub-campaign type intended to generate demand for an app before its release.

[15] This is an edge case, since we try to avoid serving ACe campaigns to users who don't have the app installed.

[16] Source here.

---

**Commented [11]:** Currently, we agreed with @johnlchen @lawrencechang ████████ that GAA won't cover 3P AAPs as App Ads strategy is to move them all to ████ SDK (Google 1P SDK) as per ████. May be good to update this accordingly.

**Commented [12]:** I see. Does Google Ads support 3P AAPs today? It had sounded from [1] like Yes. So we would be removing support then for all SDKs except for Firebase SDK?

[1] https://docs.google.com/document/d/1JLZDbKYOLSlzG_jEk3J7v3BZ-ZlSpTiBEvqdbZQX_PI/edit?hl=en&disco=AAAAGtSK9QI

**Commented [13]:** Yes for supporting 3p. No to removing support for 3p. We will require firebased SD...

**Commented [14]:** Cool, thanks, I've updated the

**Commented [15]:** @guolingh ████████, FYI.

**Commented [16]:** This may be a bit misleading since...

**Commented [17]:** Agree, advertisers can (and usual...

**Commented [18]:** I see. Can all 3 sources be

**Commented [19]:** That I dont know.

**Commented [20]:** Okay, could you clarify what you

**Commented [21]:** Minor clarification. Anton is on App...

**Commented [22]:** Whoops, sorry about that!

**Commented [23]:** re:AAP- correct.but on Google Ad...

**Commented [24]:** yes GA supports conversions only...

**Commented [25]:** >> yes GA supports conversions

**Commented [26]:** What do we mean by 3p data? 3p...

**Commented [27]:** Ads will still use conversion pings

**Commented [28]:** Right, for LC attribution app ads w...

**Commented [29]:** Makes sense

**Commented [30]:** +1 to the above.

**Commented [31]:** +balachandar ████████ o

**Commented [32]:** Currently we don't yet have 3p AA...

**Commented [33]:** Currently, we agreed with

**Commented [34]:** I see. Does Google Ads support 3...

**Commented [35]:** Yes for supporting 3p. No to

**Commented [36]:** Cool, thanks, I've updated the

**Commented [37]:** @guolingh ████████ FYI.

**Commented [38]:** eCPC also accounts for conversio...

**Commented [39]:** Not sure I follow - mind clarifying

**CLICK-THROUGH CONVERSIONS** — Based on a click, within a 30-day window on all AC ad formats

**VIDEO ENGAGEMENTS** — When a user watches a **video ad** for **more than 10 seconds**, and converts within a 2-day window (ACi) or 1-day window (ACe)

**VIEW-THROUGH CONVERSIONS** — Based on a **viewable impression**, >50% on Screen >2 sec within a 24-hour window and on all ACi ad formats, excluding Search channel

There are dependencies between different types of app conversions (e.g., in-app conversions can only happen after install conversions). ▮▮▮▮▮▮▮▮ sets out to bring more reflective credits for install-focused campaigns when users convert through in-app engagements after installation. This project has an expected impact of +$XXM ARR. Data-driven attribution (DDA) will take a machine-learning approach to dealing with these dependencies instead of applying ▮▮▮▮ duplication logic (e.g., pre-install checks). However, ▮▮▮▮ is applied automatically to last click attribution.

▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮

**Commented [40]:** @chuy▮▮▮▮▮▮▮ I'm not sure I would characterize ▮▮▮▮ in this way. ▮▮▮▮ is really cross-campaign duplication of credit, not DDA. @beckerman▮▮▮▮

**Commented [41]:** Agree. ▮▮▮ is an intermediate step and would become one of the use cases of DDA in the future, but in itself it is in no way DDA.

**Commented [42]:** I had taken the word of the PRD review presentation linked here - sounds like I might have misinterpreted. Reworded based on your input. Thanks!

**Commented [43]:** We had some discussions on these topics before. The notes are here --
https://docs.google.com/document/d/101y8mnj7oWW4VKHRdKAigAJ6Z4xwo3tElvPQUKjF_Sc/edit#heading=h.bcy0moi8v00g.

Apologies that you were not in these discussions. I am happy to sync with you f2f if it helps.

For now we said that for DDA, we will not apply pre-install check or do duplication like ▮▮▮ as DDA will address them directly. @johnlcher▮▮▮▮▮

**Commented [44]:** Ah, no problem and good to know - added clarification here. Thanks for helping keep this accurate!

Appify also comes up frequently in this context. Appify is not a campaign type but rather a technology layer that allows Search, Shopping, and GDA campaigns to deep-link into apps using URLs. This is a strategically important way to drive app conversions and therefore part of the app attribution story. App conversion tracking is complex since conversions can occur either on an app's mobile website (no deep link) or in the app itself (Appify deep link).

Appify works when an advertiser sets up app links (Android, iOS). When app links are set up, mobile users who click on an ad with a URL landing page are not prompted to choose how to open the link but are instead taken directly to the advertiser's app. Mobile users who don't have the advertiser's app installed and users on Desktop are directed to the advertiser's website.

App ad interactions like clicks, engaged views[17], and playable views[18] are logged in ▮▮. These interactions can happen on a range of surfaces, since app ads can appear in many places.

Here's a system diagram showing how app data comes together for attribution:



### Key facts, considerations, and points of discussion

- As with any other form of attribution, coverage of both ad interactions and conversions is critical. We realize we may never have the complete picture here. Here's a diagram of the app conversion flow:

---

[17] User watched the video for 10 seconds or until the end.

[18] User watched the video for less than 10 seconds.

█████████████████████████████████████

- With the exception of app installs, "app conversions" refer to conversions that happen within an app on a mobile device.
- Google Analytics in the future may only support Firebase SDK, per our ██████ strategy. Today, we recommend advertisers "dual tag," meaning that they use both our Firebase SDK and an AAP.

█████████████████████████████████████

- Google Analytics today only supports last click attribution and uses a fixed lookback window[19] of 180 days. There's an open question about what ether lookback windows we should support for different interaction types. ████████████████████
  ████████████████

  - ████████████████████████████
    ████████████████████████████
    ████████████████████████

**Commented [45]:** On the Ads side, @beckerman████████████s leading a project to introduce configurable lookback windows for different interaction types.

**Commented [46]:** Kechy and I discussed Project Windows and its implications on ████ at length :)

**Commented [47]:** Heh, she alluded to those when I chatted with her, too. What would you say makes this problem most difficult? Is it that there are different opinions about what the right lookback windows are, or that some systems have deep-baked assumptions around lookback window lengths, or something else?

**Commented [48]:** I think just the fact that we have different window types and offered window ranges that affect our optimization and attribution both in Ads and in 3P AAPs. Changing windows, introducing new windows, etc. is very complicated.

---

[19] More about lookback windows here:
https://docs.google.com/document/d/15hkRX6yxo5HfvXiFyorlaUmz7tDIxQfTek_S1elvz90/edit?hl=en#bookmark=id.2w45gl2tzs4j.

- There are two specific questions:
  1. What lookback window requirements does the ▮▮▮▮ team have for Apps training data?
     - Decision: Use a ▮▮▮▮▮▮▮▮▮▮ for training instead of ▮ (the default in ▮▮) for now.
  2. There are a few places lookback windows are relevant in Ads. GAA supports Default, ▮▮▮▮▮▮▮▮▮▮▮▮▮ windows in its reports. In AWCT / core Ads reports, we honor the conversion windows set by the user. What work is needed to support these use cases?
     - This is still being investigated.
     - We will not train on or report app conversions whose last click falls outside the advertiser's configured conversion window (the logic is a bit custom, as described here). In other words, when advertisers select a preset lookback window of ▮▮▮▮▮▮▮▮ in their reports, the conversions reported only include those with a last click within the advertiser's configured conversion window. This is aligned with how GAA handles web conversions today. (The reason behind it is that conversions without a last click within the conversion window are eligible for conversion modeling. We wouldn't want to include an observed conversion of this kind, only to have it modeled too.)

[black redaction box]

- Google Analytics is working to support x-network data-driven attribution, which would attribute credits to non-Google sources. These credits will be stored in the JACCC logs and used exclusively by Google Analytics (not by Google Ads).

- When Google Analytics exports conversion credits to Google Ads, it's always on a last click basis. For website conversions today, Google Analytics exports x-network last click credits to

**Commented [49]:** @shuangsu ▮▮▮▮▮▮ and @qinghua ▮▮▮▮▮ to formalize as needed!

**Commented [50]:** I had some discussion with Qinghua, and so far, we agree on not reporting/training on a conversion if its last click is out of the user configured LBW, even if a click might be within the ▮▮▮▮▮▮▮▮▮
This is the current behavior for GAA web, and I prefer keeping the same behavior for App.
The reason for not including such a conversion for reporting/training is that this conversion eligible to be used in conversion modeling in Ads. If this conversion ends up being modeled, then we might report it as two conversions in some LBWs, one is observed, the other is modeled.

**Commented [51]:** That makes a lot of sense - thanks for the explanation. Is there still a question that we should track here, then, or should we consider question #2 resolved?

**Commented [52]:** Question for Shuang:
>> not reporting/training on a conversion if its last click is out of the user configured LBW.
So if the last click is an EV, we use EV LBW and if it is a physical click, we use CTC, is that correct? what if the last click is an EV which is outside of EV LBW, but we still have a physical click within CTC LBW?

**Commented [53]:** This conversion is also filtered.

**Commented [54]:** Wenjie, was the thinking behind your question to see if the rule here [1] was applied?
Shuang, I tried to document this comment here ▮▮

**Commented [55]:** >> was the thinking behind your question to see if the rule here [1] was applied?
No. these conversions will not be seen by aggregatio ▮▮

**Commented [56]:** [2] LGTM.

**Commented [57]:** FYI, this is only for x-channel DDA exports. The Google Ads preferred DDA (currently done through GAA path for web but proposed to be ▮▮

**Commented [58]:** Thanks for clarifying this, Bala. @hetal ▮▮▮▮▮, how should I reconcile what Bala's flagging with what we talked about last week?

**Commented [59]:** I think what Bala is saying is inline with what we discussed last week. I think it might help to add a bullet point here saying that we will also ▮▮

**Commented [60]:** FYI, this is only for x-channel DDA exports. The Google Ads preferred DDA (currently done through GAA path for web but proposed to be ▮▮

**Commented [61]:** Thanks for clarifying this, Bala. @hetal ▮▮▮▮▮, how should I reconcile what Bala's flagging with what we talked about last week?

**Commented [62]:** I think what Bala is saying is inline with what we discussed last week. I think it might help to add a bullet point here saying that we will also ▮▮

Google Ads. These can be thought of as (conversion, ad interaction) tuples, and conversions without a corresponding click are not sent.

- For website conversions, Google Ads performs conversion modeling (███████████ ██) on this data to infer ad interactions we may have missed. This modeling sometimes infers an ad interaction that should receive last click credit for a (currently unattributed) conversion. This ad interaction is then joined to other, earlier ad interactions to form a path. (On Search and GDA, modeled data makes up a small fraction of total conversions. On YouTube, modeled data can make up a decent fraction though is still the minority.)

- For app conversions, we'll follow a similar pattern: Google Analytics will emit (conversion, ad interaction) pairs to Ads ███████ based on last click attribution. Ads will model on top of this to generate modeled conversions ███████ GAA will then consume Google Analytics collection logs, ███ and ███ to build multi-touch paths and send these paths to ███████ on ███████ will then generate attribution credits (for all 6 models) used for GAA and AWCT reporting and bidding. The official system of record for the design is here. The following is just a sketch of the process.

    - Both Google Analytics and AAPs already export app conversions on a last click basis — that is, (conversion, ad interaction) tuples. This is the key input to Google Ads and will not change.
    - We'll need to expand the limited app conversion modeling we do today. ████████
    - In 2021, in addition to ███████████████████████████ ████████ █ ██████████████████████████████████ ██████████
    - As of August 2020, it was decided that the data processing for Ads-preferred DDA credits will happen on Google Analytics infrastructure (███ on ███████ but will only be surfaced in Google Ads Attribution reporting.
    - UI, aggregation, and serving will be done on the Google Ads side.
    - Beyond 2021, Google Analytics may surface these credits in Analytics reports as well.

- In the case where one ███ property is linked to two Ads accounts that track conversions separately, we can think of the behavior as follows:
    - ██████████████████ █ ████████████
    - ██████████████████████
    - ██████████████████
    - ██████████████████████
    - ██████████████████████
    - ██████████████████
    - ██████████████████

Commented [63]: @ctend ███████████, do you know if Google Ads uses Google Analytics' credits or still computes its own and uses that for reporting and bidding?
_Assigned to Chris Teng_

Commented [64]: Google Ads also uses its own when it comes to Google Analytics as a conversion source.

Commented [65]: Heh, so interesting  Thanks!

Commented [66]: For google analytics, app conversions, we ping over the unattributed conversions to BOW and let EventFe do the the ads preferred LC attribution. This flow is different to export of web conversions from ███ where we export only conversions attributed to Google Ads via LC X-channel model.

Commented [67]: Ah, sounds like _Attribution modeling is baked into the credits received by Google Ads_ isn't correct, then.  Rather, the conversions "sent to Google Ads" is conversion-model agnostic?

Commented [68]: @ctend ███████████, do you know if Google Ads uses Google Analytics' credits or still computes its own and uses that for reporting and ...

Commented [69]: Google Ads also uses its own whe...

Commented [70]: Heh, so interesting. Thanks!

Commented [71]: For google analytics, app ...

Commented [72]: Ah, sounds like _Attribution ...

Commented [73]: LC credits are stored in JAC logs.

Commented [74]: @ctend ███████████, do you kno ...

Commented [75]: Google Ads also uses its own whe ...

Commented [76]: Heh, so interesting. Thanks!

Commented [77]: For google analytics, app ...

Commented [78]: Ah, sounds like _Attribution ...

Commented [79]: @ctend ███████████, do you kno ...

Commented [80]: Google Ads also uses its own whe ...

Commented [81]: Heh, so interesting. Thanks!

Commented [82]: For google analytics, app ...

Commented [83]: Ah, sounds like _Attribution ...

Commented [84]: @pensadov ███████, this ...

Commented [85]: It is a shared ███████

Commented [86]: Hey all, as a follow up to this ...

Commented [87]: @kellynelson ███████ and ...

Commented [88]: Lgtm, the summary looks accurate ...

Commented [89]: LGTM

Commented [90]: lgtm, thanks for writing this!

- ████████ and GAA share the same processing pipeline, whereas GAA web uses a separate pipeline.

- Here's a diagram showing the expected difference in attribution modeling when comparing Ads-preferred data-driven attribution (new) with Ads-preferred last click attribution (current):



- There are and will likely continue to be nuanced differences between how Google Ads and Google Analytics does attribution, from the ID space used to the modeling itself. See here for more details.

- Google Ads will continue allowing developers to send 3P SDK data. Android developers can also use Android Codeless Install Tracking to send app downloads from Google Play directly to Google Ads[20]. This data just won't be usable for bidding.

- On the Incrementality front, conversion lift has been commercialized ███████████
  ████████████ This data has yet to be employed by ████████

    - We have data around the uplift of ads in GDA, YouTube, Google Play, and AdMob.
    - We do not have conversion lift data for apps in Search.

---

[20] Learn more here.

**Commented [91]:** If an app conversion is split into two different Ads accounts and therefore two different Path reports, is there any way to at least flag when a path step is fractional?

**Commented [92]:** There are ways we could show this for sure (we do in Google Analytics, ████████, but it'd require some careful design and probably medium amounts of implementation work, so I'd probably lean toward going this route only if needed. Do you think messaging via the UI, Ads HC, etc. could be a solution?

**Commented [93]:** It could be for sure - I guess it depends on how common this issue will be. ████████

**Commented [94]:** ████████
@kechyeke ████████ is that right?

**Commented [95]:** ████████

**Commented [96]:** I think it is feasible to use a flag to indicate that the path is a part of a longer paths. In backend, we can have a dimension to indicate that this path is split from another path. However, it will be difficult to provide more detailed stats, e.g. the length of the original path.

**Commented [97]:** Thanks, Kechy and Wenjie. Given the complexity here even if we wanted to show fractional paths (i.e., the fraction we'd show would be a function of the attribution model), I'm still leaning toward handling this via messaging.

**Commented [98]:** Are there more information about the lift study? How is the TEDDA team consuming the lift data to develop their model?

**Commented [99]:** @cteng ████████ would you know or be able to direct? Thanks!

**Commented [100]:** Lawrence would know, but I think it's all conjectural for now, we aren't actually doing anything with ████ for the lift data.

Right now all of the lift results live with the CL team's tables

**Commented [101]:** Ah, okay.

@lawrencechang ████████ @jiwang ████████, are there plans to use this data that I can document here?

- There have also been live holdback background studies performed on advertiser campaigns.

- App conversions should be attributable to both "Appify campaigns" (meaning: regular campaigns whose landing pages are to apps with app links set up) and AC* campaigns.

- "Appify campaigns" can lead to / should be eligible to receive credit for website conversions.

- Since AC* campaigns have selective optimization and lead to an app or app store, Attribution should not attribute credit for website conversions to AC* campaigns.

> **Commented [102]:** Can we rephrase this to "regular campaign clicks which are eligible for app conversion attribution". The definition of app conversion attribution.
>
> **Commented [103]:** Basically - once ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓
>
> **Commented [104]:** Thanks for flagging and makes sense to update this. Only question is whether we can find a less self-referential way of defining this. The point of this bullet is to clarify which campaigns are eligible for credit, so it seems strange to define this as clicks eligible for credit, heh. :-)

- The data sources for app data in ▓▓▓ and GAA are:

[24] Context here.

[REDACTED]

- For last click attribution, GAA will use AWCT last click. This is different from the behavior for Web, where GAA and AWCT use different logic to determine last click (GAA performs the computation server-side by looking at timestamps, whereas AWCT relies on custom waterfall logic).

## Data-driven attribution (DDA)

- Data-driven attribution is an attribution modeling approach that will have an implementation in Google Analytics and another in Google Ads. In Google Analytics, DDA will attribute credits to multiple networks and platforms. In Google Ads, DDA will allocate credit only among Google properties.

- Google Analytics is currently working on supporting data-driven attribution as one of the forms of multi-touch attribution for both cross-channel and ads-only paths.

- DDA for website conversions already exists in Google Analytics Classic. It is a paid feature of Multi-Channel Funnels (or MCF, available with the Google Analytics Classic UI) and is available for free in Google Analytics' Attribution reports [REDACTED]. Note: Google Analytics Classic is a web only product.

- With the migration from Classic to [REDACTED], we are working on bringing DDA into [REDACTED] as well. This feature is an adoption blocker for the migration.

- [REDACTED] is cross-platform so to ensure a consistent experience for users across app and web, we plan to support DDA for apps as well. In addition to offering a consistent experience, DDA will also help advertisers analyze the path to conversion for apps more holistically (similar to web) and will address the use cases that [REDACTED] is solving for.

- DDA for Apps started earlier this year and we have plans to launch together with DDA for website conversions next year (~Q2 2021).

- Challenges include:

[REDACTED]

**Commented [105]:** Hey @kechyeke [REDACTED] would you add a few bullets here that give an overview of the key points around bringing DDA to Google Analytics?

Maybe things like:

-When the effort began?
-How far along is it / what milestones we've already hit?
-What are the key challenges?
-etc.
_Assigned to Kechy Eke_

**Commented [106]:** Charles, I think this PRD is about GAA, not GA?
Probably also add a few bullets for conversion modeling for [REDACTED] and how those interacts with DDA, similar to the GAA YT part, modeled conversions are not used for training, but for attribution. whether it's worth evaluate DDA on modeled conversions etc.

**Commented [107]:** Added some high level bullet point, PTAL.

@lanhuang [REDACTED] maybe it's better to link to a design doc on those details?

**Commented [108]:** @kechyeke [REDACTED] do you mean the YT design documents or app? We haven't started the design for app attribution.

**Commented [109]:** Thanks, Kechy!

>> Charles, I think this PRD is about GAA, not GA?

For sure, yeah. That said, I figured that what GA was up to may play a significant role in decisions on the GAA side.

>> Probably also add a few bullets for conversion modeling for x-device, mutsu etc, and how those interacts with DDA

Lan, what would be the key points you think we should highlight here for Apps?

**Commented [110]:** [REDACTED]

**Commented [111]:** I see. For now, I've tried to capture this in the Key questions section (https://docs.google.com/document/d/1JLZDbKYOLSlz G_jEk3J7v3BZ-ZiSpTiBEvqdbZQX_PI/edit?ts=5f10db2d#bookmark=id. lz403uum730g).

As far as actually making this decision, seems like we [...]

- Initial results (from 12/2020) are here.

- It was decided in Q4 2020 that we would first launch DDA on Appify (with AC* on last click), likely in Q3 2021, then subsequently expand DDA coverage to AC* campaigns. See here for examples of how Attribution credits will be distributed in various cases.

Bidding in Google Ads
TBD.

Reporting in Google Ads

- Google Analytics has app reporting in its core reports but not yet in its Attribution reports. App reporting in core reports is unified with web reporting in ▇▇. (Adding a filter allows users to segment their app conversions from web conversions.) An example can be seen in the conversions detail report, though this data can be seen throughout other core ▇▇ reports too.

- Path reports and modeling credits for apps is expected to land in ▇▇'s Attribution reports in Q1 2021.

- Google Ads reporting encompasses both core Ads ("AWCT") reporting and reporting in Google Ads Attribution.

- Since the Google Ads Attribution backend will export app credits to AWCT, core Ads reports will be able to show the conversion stats that we compute. ▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇

- In the Google Ads Attribution UI, incorporating apps reporting amounts to a few changes, some required and others optional.

    a. [P0] Specifically for the ad group dimension, we should report on the reporting ad group and not the serving ad group.

    b. [P0] We'll increase the scope of conversions to include app conversions, which users can adjust for their reporting using this dropdown.
        - In addition to the two groups we have today (*all actions* and *all biddable actions*), we should add the following four groupings to the dropdown (example):
            - *All website conversions*
            - *All biddable website conversions*
            - *All app conversions*
            - *All biddable app conversions*
        - This gives us a total of 6 "predefined" options in the dropdown.
        - We will also update the conversion dropdown so that users can select arbitrary combinations of conversions for reporting (moving from single- to multi-select).

**Commented [112]:** Hey @beckerman▇▇▇▇▇, is there anything special about how bidding works in Google Ads for apps that might be worth noting here? _Assigned to Anton Beckerman_

**Commented [113]:** Adding @qinghua▇▇▇ and @shuangsu@google.com, too, in case there are any key points we should log here.

**Commented [114]:** @kechyeke▇▇▇, could you share a screenshot of some of these reports? Slides or other material welcome too! _Assigned to Kechy Eke_

**Commented [115]:** Added a screenshot. Let me know if you need more

**Commented [116]:** Thanks! Could you also share a screenshot of apps data in ▇▇▇?

(BTW, when I try to navigate to that page, I see https://screenshot.googleplex.com/aWOjjptBZ4M. Is there permissions to Google Analytics I need to get to see the account?)

**Commented [117]:** ▇ doesn't support apps since GA Classic didn't support apps. This is the value prop of ▇, measurement across app and web.

**Commented [118]:** >> ▇ doesn't support apps since GA Classic didn't support apps. This is the valu...

**Commented [119]:** Right. We don't have Attribution/DDA in ▇ yet so Advertisers see their...

**Commented [120]:** Got it, thanks!

**Commented [121]:** Hey @msiska▇▇▇▇, @kechyeke▇▇▇▇ @beckerman▇▇▇...

**Commented [122]:** @cteng▇▇▇

**Commented [123]:** do you have a list of metrics you plan to support in GAA reporting? LTV is a metric tha...

**Commented [124]:** The proposal here implies we keep the metrics we have today. So we have path reports...

**Commented [125]:** I agree with LTV is important, and the fundamental question is what is the best tool to...

**Commented [126]:** Good question on computation. Diff products compute differently but in Gold it's base...

**Commented [127]:** Sounds intriguing - LTV does seem like a new sort of insight worth exploring / that...

**Commented [128]:** @chuy▇▇▇ in the world of web, is this only limited to biddable conversions of...

**Commented [129]:** In GAA we support reporting that's limited to biddable conversions and reporting across...

**Commented [130]:** limiting to biddable conversions makes sense.

**Commented [131]:** To clarify, for web we have _all web conversions_ and _all biddable web...

c. ███████████████████████████████ █
███████████████████████████████████
███████████████████████████████████

████████  See more details here.

d. ███████████████████████████████
███████████████████████████████████
████████████████████

e. ██ █ ████████████████████████████
████████████████

f. [P0] We should update the *Overview page* to include app data.

g. ███████████████████████████████████
███████████████████████████████████
██████████████████
- ████████████████████████████████████
███████████████████████████████████
- ████████ ██ ██████████████████████████

h. [P2] We may choose to build additional cards on the *Overview* page to reflect app-specific insights.

- See deep dive here.

## Google Ads Attribution milestones

1) Multi-touch attribution (including DDA) for Apps for reporting and bidding.
   a) Paths where the last click is Appify[25] (Android only, non-OPC conversions, modeled conversions + spam + retraction not supported) or from an AC* campaign
   b) The following networks will be supported at launch: Search, Gmail, Display, Shopping, Youtube
   c) The conversions in scope are goals explicitly "marked as a conversion" on the Analytics side, imported into Ads, and enabled(?)
2) Mature app conversion modeling (████, LAT, XD)
3) Incrementality calibration for Apps DDA

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25 ██████████████████████████████████████████████ ████████

Commented [132]: @chuy█████████████
Commented [133]: Conversion type. In fact, as I
Commented [134]: btw, how does this work with EV
Commented [135]: In GAA reporting, we use the ter
Commented [136]: Current GDA path report only
Commented [137]: We allow configurable windows f
Commented [138]: @pensadov██████████
Commented [139]: What would it involve to add
Commented [140]: I checked with Guoling about EV
Commented [141]: >> Currently for web, we do not
Commented [142]: Just to clarify, the PMT design d
Commented [143]: >> Adding a 3-day fixed window
Commented [144]: Aggregation table contains the
Commented [145]: Would you mind updating / loopir
Commented [146]: I think default makes more sense
Commented [147]: Thanks for confirming, and make
Commented [148]: We might need a meeting to
Commented [149]: Hmm. we won't run DDA on AC*
Commented [150]: FYI, @rayluong████████
Commented [151]: @shuangs█████████
Commented [152]: Network type (channel) include
Commented [153]: By the way, by the time we're
Commented [154]: Charles, in GAA we don't have th
Commented [155]: It doesn't look like Apps is one of
Commented [156]: It looks like the app vs. web does
Commented [157]: For #1, simply extending the
Commented [158]: For #1, if we only list conversion
Commented [159]: Gotcha, yes, I've added this to th
Commented [160]: I believe that campaign types are
Commented [161]: The campaign_type column in th
Commented [162]: For #2. Device and stream shoul
Commented [163]: Update here: campaign_type
Commented [164]: @chuyi███████Am I corre
Commented [165]: I guess (c) and (d) convey that a
Commented [166]: Thanks, so I think no additional l
Commented [167]: Right, yeah, modulo any edges
Commented [168]: @chuyi████████Could you
Commented [169]: This is just meant to convey that
Commented [170]: Sounds good!
Commented [171]: Thanks both. It sounds like the
Commented [172]: Agree, than█
Commented [173]: @kechyeke█████and
Commented [174]: I think we need to align with █

## Key questions

See active discussions Apps in GAA and DDA for Apps Open Actions.

**Commented [175]:** Is this answered? My understanding is 3ps will still play a big role as source of truth for app advertisers.

**Commented [176]:** Yeah, that's the current thinking. I added a second sub-bullet to capture this.

**Commented [177]:** Is this "app attribution data" or just "app conversion data"?

**Commented [178]:** Is this referring to Ads preferred DDA or X-channel DDA?
@chuy
_Assigned to Charles Huyi_

**Commented [179]:** Could you help me understand what each one is? Are x-channel DDA credits what Analytics produces and Ads preferred DDA what Google Ads produces using raw, unattributed conversions data from Analytics? This is closely related to
https://docs.google.com/document/d/1JLZDbKYOLSIz G_jEk3J7v3BZ-ZISpTiBEvqdbZQX_PI/edit?ts=5f1321c5.

**Commented [180]:** Do we plan to add app conversion attribution report to the existing GAA report?

**Commented [181]:** Thanks for kicking off the discussion.
Added a few questions / points of confirmation here to see if we're all aligned in our initial understanding of things.

https://docs.google.com/document/d/1JLZDbKYOLSIz G_jEk3J7v3BZ-ZISpTiBEvqdbZQX_PI/edit?ts=5f29f47b#bookmark=id.f s22o7pgueks.

**Commented [182]:** Given the decisions in https://docs.google.com/presentation/d/1aepA/c3fnP9q wrpuFssb4GOybef7gndPmnjUKWjKPQs/edit#slide=i(

**Commented [183]:** +1

**Commented [184]:** Thanks Hetal. With perf and okrs coming soon, it would help to schedule this sooner rather than later.

**Commented [185]:** Hetal, feel free to set up, or if you share a list of attendees, I'm happy to do it too.

**Commented [186]:** Scheduled for Friday tentatively. Please feel free to modify as needed. Thanks

**Commented [187]:** For me to understand the background, is it possible for the app owner to use the same account and different campaigns to measure

**Commented [188]:** >> is it possible for the app owner to use the same account and different campaigns to measure different conversion objectives (e.g. install v

**Commented [189]:** The issue further complicates when each account have different conversion types: if one account has DDA and other account says do las

**Commented [190]:** @pensado[ ], could you update this placeholder to reflect the point / question you raised during today's meeting?  Thanks!

@hetal[ ], FYI.
_Assigned to Armando Pensado_

**Commented [191]:** This part just wasn't clear to me since I'm not familiar with apps, it sounds like apps

**Commented [192]:** Ah, not just, apps can also attribute to Search campaigns, app campaigns, etc. [

**Commented [193]:** Sorry I still don't quite get it. Maybe I'm mixing up what it means to attribute to an app

**Commented [194]:** Adding a Network != "YouTube" filter in path reports / _Model comparison_ could filter

**Commented [195]:** I don't want to butcher your doc, so sounds like there's two things to watch out for:

**Commented [196]:** Butcher away, heh, no worries.  I've captured your two points at the end of th

**Commented [197]:** ok, I simplified to what was my point, feel free to add back your words if you feel that

**Commented [198]:** Thanks!

**Commented [199]:** @msiska[ ] are there any special considerations we should keep in mind

**Commented [200]:** Do we plan to add more dimensions in the reports? e.g. app vs web?

**Commented [201]:** @kellynelson[ ]nd @cteng[ ] what do you think - are there

**Commented [202]:** @jcole[ ] to help

**Commented [203]:** I'd think web vs. app conversions for sure. If by conversion type you mean segments lik

**Commented [204]:** >> I'd think web vs. app conversions for sure.

**Commented [205]:** +1 to app vs web and exposing conversion type (EVC vs Click) - would love to align

**Commented [206]:** Hmm, could you explain EVC vs. Click further?

**Commented [207]:** we recently started exposing "ad interaction type" so customers can see which

**Commented [208]:** Thanks for sharing the pointer! Logged this in the _Reporting in Google Ads_ section

**Commented [209]:** yes - i believe something like that would be entirely adequate for apps customers

**Commented [210]:** @lanhuan[ ] what are the key teams we should list here?

**Commented [211]:** Charles, I would imagine we can start with a similar group of teams like GDA for GAA.

**Commented [212]:** Sure, added placeholders. We can consolidate if needed. Would you want to start

## Implementation

**■ Aggregation**
**Owner: ■**
- A
- B
- C

**■ - QE**
**Owner: ■**
- A
- B
- C

## GAA - Processing (Ingestion)
**Owner: ■**
- Note: There may not be any changes needed to the GAA system since we are proposing to do both the GA and GAA path on ■ instance of ■ (i.e., Ads-preferred DDA and x-

channel DDA attribution will be done on a single stack unlike web where we have GAA as a separate stack / system.)

GAA - Processing (Attributor)

**Owner:** ███
- A
- B
- C

GAA - Modeling

**Owner:** ███
- A
- B
- C

GAA - Processing (Ingestion)

**Owner:** ███
- A
- B
- C

GAA - PMT

**Owner:** ███
- A
- B
- C

GAA - Export (AWCT reporting and bidding)

**Owner:** ███
- A
- B
- C

GAA - Aggregation

**Owner:** ███
- A
- B
- C

GAA - Serving

**Owner:** ███
- A
- B
- C

GAA - UI
**Owner:** ▆
- A
- B
- C

GAA - AP / Evenflow
**Owner:** ▆
- A
- B
- C

GAA - Bidding
**Owner:** ▆
- A
- B
- C

**Timelines**

- Oct 15: Google Analytics will provide path data to the ▆▆ team.

# Appendix A-15

HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

```
 1              UNITED STATES DISTRICT COURT

 2            NORTHERN DISTRICT OF CALIFORNIA

 3

 4    ANIBAL RODRIGUEZ, JULIEANNA          )

 5    MUNIZ, ELIZA CAMBAY, SAL             ) Case No.:

      CATALDO, EMIR GOENAGA, JULIAN        ) 3:20-cv-04688

 6    SANTIAGO, HAROLD NYANJOM, KELLIE     )

 7    NYANJOM, and SUSAN LYNN HARVEY,      )

 8    individually and on behalf of all   )

 9    others similarly situated,          )

10                   Plaintiffs,          )

          vs.                             )

11    GOOGLE LLC,                         )

12                   Defendant.           )

      ------------------------------------)

13      ***HIGHLY CONFIDENTIAL - ATTORNEYS EYES ONLY***

14

15               REMOTE PROCEEDINGS OF THE

16          VIDEOTAPED DEPOSITION OF STEVE GANEM

17               FRIDAY, OCTOBER 28, 2022

18

19

20    REPORTED BY NANCY J. MARTIN

21    CSR. NO. 9504, RMR, RPR

22    CLAUDIA R. GARCIA, CSR. 12812

23    JOB No. 5554575

24

25    PAGES 1-325

                                            Page 1
```

1           MR. SANTACANA:  Compound.

2           THE WITNESS:  The Google Analytics customer

3    needs to create a Google Analytics account, agree to

4    the terms of service, including disclosure policies

5    and consent policies.  They would need to integrate

6    the Google Analytics for Firebase SDK.  They would

7    need to enable the Google signals setting, which,

8    again, by default is turned off for all customers.

9           The end users who use their apps would need

10   to be signed in on their device.  They would have to

11   turn on ads personalization, turn on app and web

12   activity, turn on what we would refer to as sWAA which

13   is -- which allows for the web and app activity in

14   third-party sites that integrate Google services to be

15   associated with their accounts.

16           And only in those circumstances would it be

17   possible for their GAIA identity to be joined in and

18   written to separate logs, not the same logs as they're

19   pseudonymous log activity.

20   BY MR. MAO:

21       Q.  So this first log said that you called app

22   measurement, these are ███████████████?

23           (Pause.)

24   BY MR. MAO:

25       Q.  Sir?

                                              Page  44

```
 1        A.   I can answer in the context of Google

 2   Analytics.

 3        Q.   Yeah.  Please, for Google Analytics.

 4        A.   In the context of Google Analytics, when

 5   events from a third-party SDK are transmitted to our

 6   servers, if that IDFA is not mappable, if it even is

 7   present subject to all the settings I mentioned, if

 8   that's not mappable to any GAIA, and since the

 9   settings you're referring to are GAIA-related account

10   settings, there's no way to look up the sWAA settings,

11   and there's no attempt to infer that in Google

12   Analytics.

13        Q.   So where on iOS -- after iOS 14 was released,

14   there is no way to do that look up, what does Google

15   Analytics for Firebase do with regard to data coming

16   in for the          ?  Does it get associated with the

17   GAIA side or the non GAIA side?  Like what happened

18   after iOS 14, I guess, is my question?

19        A.   Data corresponding to user interactions in

20   the app are transmitted and associated with

21                                    in the app measurement logs,

22   as they've always been.

23             What's different is that since there is

24   practically no way to look up the corresponding GAIA

25   and/or to check its sWAA settings, there's no writing
```

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```
1                    C E R T I F I C A T E

2           I, the undersigned, a Certified Shorthand

3    Reporter of the State of California, do hereby certify;

4           That the foregoing proceedings were taken

5    before me stenographically at the time and place herein

6    set forth; that any witnesses in the foregoing

7    proceedings, prior to testifying, were administered an

8    oath; that a record of the proceedings was made by me

9    using machine shorthand which was thereafter

10   transcribed under my direction; that the foregoing

11   transcript is a true record of the testimony given.

12           Further, that if the foregoing pertains to the

13   original transcript of a deposition in a Federal Case,

14   before completion of the proceedings, review of the

15   transcript [ ] was [ ] was not requested.

16           I further certify I am neither financially

17   interested in the action nor a relative or employee or

18   any attorney or any party to this action.

19           IN WITNESS WHEREOF, I have this date

20   subscribed my name.

21           Dated:   November 22, 2022

22

23

24   _____

25       CLAUDIA R. GARCIA, CSR. 12812
```

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# Appendix A-16

Appendix X4 to Black Expert Rebuttal Report - Fingerprinting Policy Language.xlsx

| Exhibit | Policy Title | Effective Date/Last Reviewed | Language in Policy |
|---|---|---|---|
| 1 | Device Fingerprinting and Immutable Identifiers Policy (go/fingerprintingpolicy) | January 21, 2015 | Device, app, or browser fingerprinting or immutable identifiers must not be used in any Google products or services for the purposes of: • Tracking user behavior, including: o Ad measurement and prediction o Ad targeting • Recording preferences<br><br>It is recommended that immutable IDs under Google's control ( e.g., returned by Chrome or Android APis) have minimal scope ( e.g., per recipient). They should be statistically independent between scopes (i.e., it is not possible to infer recipient A's ID from recipient B's). Example: for DRM authentication, our API should return a different identifier for each recipient ( e.g., Netflix, Vudu). |
| 2 | Device Fingerprinting and Immutable Identifiers Policy (go/fingerprintingpolicy) | January 21, 2015 | Device, app, or browser fingerprinting or immutable identifiers must not be used in any Google products or services for the purposes of: • Tracking user behavior, including: o Ad measurement and prediction o Ad targeting • Recording preferences<br><br>It is recommended that immutable IDs under Google's control ( e.g., returned by Chrome or Android APis) have minimal scope ( e.g., per recipient). They should be statistically independent between scopes (i.e., it is not possible to infer recipient A's ID from recipient B's). Example: for DRM authentication, our API should return a different identifier for each recipient ( e.g., Netflix, Vudu). |
| 3 | Device Fingerprinting and Immutable Identifiers Policy (go/fingerprintingpolicy) | February 24, 2016 | Device, app, or browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of: • Tracking user behavior, including: o Ad measurement and prediction o Ad targeting • Recording preferences<br><br>Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APis should be per recipient. Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient ( e.g., Netflix, Vudu). |
| 4 | Device Fingerprinting and Immutable Identifiers Policy (go/fingerprintingpolicy) | February 24, 2016 | Device, app, or browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of: • Tracking user behavior, including: o Ad measurement and prediction o Ad targeting • Recording preferences<br><br>Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APis should be per recipient. Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient ( e.g., Netflix, Vudu). |
| 5 | Device Fingerprinting and Immutable Identifiers Policy (go/fingerprintingpolicy) | May 12, 2017 | Device, app, or browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of: • Tracking user behavior, including: o Ad measurement and prediction o Ad targeting • Recording preferences<br><br>Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APis should be per recipient. Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient ( e.g., Netflix, Vudu). |
| 6 | Device/App/Brower Fingerprinting and Immutable Identifiers Policy (go/fingerprintingpolicy) | October 12, 2017 | Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of: • Tracking user behavior, including: o Ad measurement and prediction o Ad targeting • Recording preferences<br><br>Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APis have minimal scope ( e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient ( e.g., Netflix, Vudu). |

Appendix X4 to Black Expert Rebuttal Report - Fingerprinting Policy Language.xlsx

| # | Policy | Date | Language |
|---|---|---|---|
| 7 | Device/App/Brower Fingerprinting and Immutable Identifiers Policy | October 12, 2017 | Device/app/browser fingerprinting or immutable identifiers **must not** be used by any Google products or services for the purposes of:<br><br>Tracking user behavior, including:<br>Ad measurement and prediction<br>Ad targeting<br>Recording preferences<br><br>Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APis have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu). |
| 8 | Device/App/Brower Fingerprinting and Immutable Identifiers Policy | May 30, 2018 | Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of:<br><br>Tracking user behavior, including:<br>Ad measurement and prediction<br>Ad targeting<br>Recording preferences<br><br>Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APis have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu). |
| 9 | Device/App/Brower Fingerprinting and Immutable Identifiers Policy | August, 27, 2019 | Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of:<br><br>Tracking user behavior, including:<br>Ad measurement and prediction<br>Ad targeting<br>Recording preferences<br><br>Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APis have minimal scope (e.g., per recipient) Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu). |
| 10 | Device/App/Brower Fingerprinting and Immutable Identifiers Policy | September 03, 2019 | N/A |
| 11 | Device/App/Brower Fingerprinting and Immutable Identifiers Policy | January 9, 2020 | N/A |
| 12 | Device/App/Brower Fingerprinting and Immutable Identifiers Policy | January 9, 2020 | N/A |
| 13 | Device/App/Brower Fingerprinting and Immutable Identifiers Policy | January 9, 2020 | N/A |
| 14 | Device/App/Brower Fingerprinting and Immutable Identifiers Policy | January 9, 2020 | N/A |
| 15 | Digital Fingerprinting and Immutable Identifiers Policy | January 9, 2020 | If fewer than 1000 users in the user base share a set of characteristics (hardware, software, and/or network attributes), that set is considered to be Unique in the context of this Policy. This helps to ensure the Unique set of characteristics can't be used to identify individuals. |
| 16 | Digital Fingerprinting and Immutable Identifiers Policy | May 19, 2021 | If fewer than 1000 users in the user base share a set of characteristics (hardware, software, and/or network attributes), that set is considered to be Unique in the context of this Policy. This helps to ensure the Unique set of characteristics can't be used to identify individuals. |
| 17 | Digital Fingerprinting and Immutable Identifiers Policy | May 19, 2021 | If fewer than 1000 users in the user base share a set of characteristics (hardware, software, and/or network attributes), that set is considered to be Unique in the context of this Policy. This helps to ensure the Unique set of characteristics can't be used to identify individuals. |
| 18 | Digital Fingerprinting and Immutable Identifiers Policy | May 31, 2021 | Non-Compliance<br>**Access to and use of User Data may be monitored, and violations of this Policy may result in disciplinary action, including termination of employment.** |
| 19 | Digital Fingerprinting and Immutable Identifiers Policy | May 31, 2021 | Non-Compliance<br>**Access to and use of User Data may be monitored, and violations of this Policy may result in disciplinary action, including termination of employment.** |
| 20 | Google Analytics and Google Analytics for Firebase on Alphabet Properties Policy | November 25, 2019 | PII must not be collected by Google Analytics. If PII is accidentally tracked by Google Analytics, you must scrub it out of GA's data repository.<br><br>    An Alphabet property must not collect PII or identifers that can be joined to PII in Google Analytics.<br>    If PII is accidentally tracked by Google Analytics, you must report the details to PII injection reporting form so this data can be scrubbed out of GA's data repository. (This process is managed by analytics-data-deletion-requests@, not by pwg-analytics@).<br>    An Alphabet property must not send either explicit location or indirect user position information (except as included in default analytics collection) into an Analytics property.<br>    An Alphabet property must ensure Google Analytics cookies are not logged by the product (separately from Google Analytics).<br>    Do not collect cid (or application instance id) to non-GA storage such as Sawmill and/or Clearcut. |
| 21 | MDI user data and consents | March 28, 2018 | Personal App content. . .(data doesn't leave the device, and isn't GAIA-keyed) |

Appendix X4 to Black Expert Rebuttal Report - Fingerprinting Policy Language.xlsx

| 22 | | | November 9, 2020 | Google purges the original, un-redacted IP addresses from all datastores (including backups) within 9 months of collection. . .In Sawmill, we start scrubbing nearly 3 months before the deadline. |
|---|---|---|---|---|
| | | | | We remove certain other information at the same time as IP addresses. Usually these redactions were requested by the product teams or privacy team at the time the field was added to Sawmill. We also apply TTL scrubbing during this pass, for non-personal logs. |
| | | Scrubbing policies for Log Data | | Within 18 months of collecting pseudonymous logs, we redact cookies and any other stable identifiers within the log to lower its reidentification risk. In particular, we try to break links that would tie records together over long periods of time, because building months-long sessions of user activity makes it more likely that the data can be reidentified . |
| 23 | | | June 24, 2019 | Access to and use of User Data may be monitored, and violations of this policy and other privacy policies may result in disciplinary action, including termination of employment. Googlers and TVCs observing violations of these policies should report them at go/incidentresponse |
| | | | | • Authorization to access Personally Identifiable User Data may require user consent. In addition to approval by the Data Owner, Personally Identifiable User Data access may require verifiable user consent in a manner approved by Google Product Counsel. See User Data Access Authorization Guidelines for more information. |
| | | | | • Authorization is granted only for a specific purpose. Authorized access to User Data for one purpose does not mean it can be used for another purpose. Do not access User Data for anything other than the original authorized purpose without seeking additional authorization from the Privacy Working Group or appropriate User Data Delegate. |
| | | | | • Googlers should use Anonymous Data or Pseudonymous User Data whenever possible. Processing Anonymous or Pseudonymous User Data presents fewer risks to users than PII, and access to anonymized data may be granted in lieu of more sensitive access permissions depending on the business purpose. |
| | | | | • Keep User Data only on approved systems. User Data should be stored securely at all times on systems approved by the Privacy Working Group or User Data Delegate, and in formats that are appropriate to the sensitivity of the data according to the Data Security Policy. |
| | | User Data Access Policy | | • Only keep User Data as long as needed for the approved purposes. When User Data is no longer needed, User Data should be securely destroyed. For example, refer to User Data Retention and Deletion Policy and Data Destruction Guidelines for deletion and purging guidelines. |

# Appendix A-17

```
 1                 UNITED STATES DISTRICT COURT

 2               NORTHERN DISTRICT OF CALIFORNIA

 3                      SAN FRANCISCO

 4                        --oOo--

 5     ANIBAL RODRIGUEZ, et al.,

       individually and on behalf of

 6     all other similarly situated,

 7                    Plaintiffs,

 8     vs.                                    Case No.

                                              3:20-CV-04688

 9     GOOGLE LLC, et al.,

10                    Defendants.

       _____/

11

12

13

14

15       VIDEO-RECORDED DEPOSITION OF SAL CATALDO

16                   VERITEXT VIRTUAL

17            THURSDAY, FEBRUARY 17, 2022

18

19

20

21

22     Reported by:

23     Anrae Wimberley, CSR No. 7778

24     Job No.   5057262

25
```

Page 1

```
 1    to personalize ads on websites" --                        01:30:28

 2              (Reporter seeks clarification.)

 3        A.   I apologize, I was saying it more so so

 4    that he and I would know that we're looking at the

 5    same thing, but --                                          01:30:51

 6        MR. LEE:  She still has to write it down, so --

 7        THE WITNESS:  Yeah, no, I get it.

 8              So when I click on the advanced carrot,

 9    this paragraph comes up, "Also use your activity and

10    information from Google services to personalize ads        01:31:09

11    on websites and apps that partner with Google to

12    show ads."

13              Next sentence, "This stores data from

14    websites and apps that partner with Google in your

15    Google account."                                           01:31:30

16              So -- and that box is checked off.  So

17    right now, it is not checked, it's blank.

18              And so if I go to these settings and I

19    see -- so going back to your question, Eduardo, to

20    say that the ad settings are where the privacy            01:32:03

21    policy would control that and why is it still on, I

22    would say the ad settings are allowing the

23    information I've shared to Google to potentially be

24    used to personalize my ads saying, Do you want us to

25    use information that we have to personalize your          01:32:25
```

Page 152

```
 1    ads?                                              01:32:27

 2              To me, the WAA setting says can Google

 3    have certain information.  So my expectation is, if

 4    I've told Google don't take certain information

 5    using the WAA setting, I don't have to have the ad   01:32:44

 6    setting also off.  The ad setting doesn't override

 7    and now allow Google to collect information that I

 8    didn't allow it to collect in the first place.

 9              If I read that ad setting, it's saying, Do

10    you want us to personalize your ads, yes or no?  Not  01:33:01

11    do you want us to go take information to increase

12    your ads?

13              WAA tells me whether or not you can take

14    and collect information, and if I've said, "No,"

15    then it shouldn't matter what I do with my ads later  01:33:12

16    on because I've already told you not to take my

17    data.  So you shouldn't have data with which to

18    personalize my ads.

19    BY MR. SANTACANA:

20        Q.    That's very helpful, and just a reminder    01:33:21

21    to speak slowly even when you're thinking quickly.

22    But yes, that's very helpful, and I understand your

23    answer.

24              Let's continue through the privacy policy

25    for a moment.                                        01:33:34
```

                                                        Page 153

```
 1              I, the undersigned, a Certified Shorthand

 2      Reporter of the State of California, do hereby

 3      certify:

 4              That the foregoing proceedings were taken

 5      before me at the time and place herein set forth;

 6      that any witnesses in the foregoing proceedings,

 7      prior to testifying, were administered an oath; that

 8      a record of the proceedings was made by me using

 9      machine shorthand which was thereafter transcribed

10      under my direction; that the foregoing transcript is

11      a true record of the testimony given.

12              Further, that if the foregoing pertains to

13      the original transcript of a deposition in a Federal

14      Case, before completion of the proceedings, review

15      of the transcript ( ) was (X) was not requested.

16              I further certify that I am neither

17      financially interested in the action nor a relative

18      or employee of any attorney of any party to this

19      action.

20              IN WITNESS WHEREOF, I have this date

21      subscribed my name.

22      Dated:  February 28, 2022

23

24

25              ANRAE WIMBERLEY, CSR No. 7778
```

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# Appendix A-18

HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

```
 1              UNITED STATES DISTRICT COURT

 2            NORTHERN DISTRICT OF CALIFORNIA

 3

 4    ANIBAL RODRIGUEZ, et al.,

 5              Plaintiffs,

 6    v.                            Case No.

 7    GOOGLE LLC,                   20-cv-04688-RS

 8              Defendant.

 9    *********************************

10     HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

11

12          ZOOM VIDEOTAPED DEPOSITION OF

13                 BELINDA LANGNER

14           Thursday, December 15, 2022

15                  9:09 a.m. PST

16

17

18    REPORTED BY:

19    BELLE VIVIENNE, RPR, CRR, NJ-CRR,

20    WA/CO/NM-CCR

21    NATIONALLY CERTIFIED REALTIME

22    COURT REPORTER

23    JOB No. 5628019

24

25    PAGES 1 - 290
```

<div align="right">Page 1</div>

HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

```
 1              MR. SANTACANA:  Vague.              11:21:10

 2       A.     Mr. Mao, specifically I said        11:21:15

 3   when sWAA is off, the Google Ads systems       11:21:17

 4   do not use the data from Firebase             11:21:22

 5   associated with that device in the            11:21:27

 6   pseudonymous space for ads                    11:21:30

 7   personalization.                             11:21:32

 8   BY MR. MAO:                                   11:21:33

 9       Q.     Okay.  But does Google serve ads    11:21:34

10   nonetheless where WAA or sWAA is off still    11:21:38

11   using the ADID or the IDFA, if they're        11:21:42

12   available?                                    11:21:46

13              MR. SANTACANA:  Vague.              11:21:47

14   BY MR. MAO:                                   11:21:47

15       Q.     Let me perhaps help,               11:22:17

16   Ms. Langner.  I'm definitely not trying to    11:22:19

17   trick you with this.  If you don't mind,      11:22:21

18   I've actually introduced Exhibit Number 2.    11:22:23

19       A.     Sure.                              11:22:25

20       Q.     Maybe this will help a little      11:22:26

21   bit.                                          11:22:27

22              MR. MAO:  And for Exhibit           11:22:28

23       Number 2, Mr. Santacana, I'm only         11:22:31

24       asking regarding Interrogatory            11:22:32

25       Number 1, okay?                           11:22:35
```

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```
 1                   CERTIFICATION

 2

 3        I, BELLE VIVIENNE, a Nationally

 4   Certified Realtime Reporter, do hereby

 5   certify:

 6        That the witness whose testimony as

 7   herein set forth, was duly sworn by me;

 8   and that the within transcript is a true

 9   record of the testimony given by said

10   witness.

11        I further certify that I am not

12   related to any of the parties to this

13   action by blood or marriage, and that I am

14   in no way interested in the outcome of

15   this matter.

16        IN WITNESS WHEREOF, I have hereunto

17   set my hand this 19th day of December

18   2022.

19

20

21

22

23   BELLE VIVIENNE, CRR, CCR, RPR

24

25
```

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# Appendix A-19

```
 1              UNITED STATES DISTRICT COURT

 2              NORTHERN DISTRICT OF CALIFORNIA

 3

 4   ANIBAL RODRIGUEZ, et al.,

 5        Plaintiffs,

 6            vs.              Case No. 3:20-cv-04688-RS

 7   GOOGLE LLC,

 8        Defendant.

     _____

 9

10

11

12

13

14            DEPOSITION OF MICHAEL J. LASINSKI, taken

15   on behalf of the Defendant, at Willkie Farr &

16   Gallagher, LLP, One Front Street, 34th Floor,

17   San Francisco, California, commencing at

18   10:19 a.m., Thursday, June 29, 2023 before

19   REBECCA L. ROMANO, a Certified Shorthand Reporter,

20   Certified Court Reporter, Registered Professional

21   Reporter.

22

23

24

25
```

Page 2

| | | |
|---|---|---|
| 1 | result of what the value of nonpersonal -- | 12:20:04 |
| 2 | personalized ads would be versus the value of | |
| 3 | personalized ads, or the revenue generated from | |
| 4 | personalized ads versus nonpersonalized ads. | |
| 5 |     Q.  So my question was whether you reached a | 12:20:28 |
| 6 | conclusion as to how GAP and sWAA differ with | |
| 7 | respect to their impact on personalization of ads. | |
| 8 |       And you answered as to your understanding | |
| 9 | of GAP, I think.  Feel free to elaborate though. | |
| 10 |       But can you now address sWAA? | 12:20:46 |
| 11 |       MR. LEE:  Objection.  Vague. | |
| 12 |       Answer if you can. | |
| 13 |       THE DEPONENT:  I thought that I had | |
| 14 | answered that. | |
| 15 |       But the second half of my answer is, my | 12:20:55 |
| 16 | understanding is that sWAA -- my understanding is | |
| 17 | that Google has represented that sWAA-off users do | |
| 18 | not receive personalized ads. | |
| 19 |       And so in calculating my unjust | |
| 20 | enrichment, I looked at -- what I was looking for | 12:21:18 |
| 21 | there was the relationship between personalized and | |
| 22 | unpersonalized ads.  And that's -- and so I use the | |
| 23 | GAP tracker -- the GAP -- the GAP's relationship | |
| 24 | between personalized and unpersonalized ads from a | |
| 25 | revenue standpoint for my calculations. | 12:21:44 |

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```
1              In -- you said that was for Scenario 2.        12:23:33

2              For Scenario 1, did you assume that

3     sWAA-off users received personalized ads from

4     sWAA-off data?

5         A.   No.                                            12:23:49

6         Q.   So for neither scenario did you assume

7     that sWAA-off users were receiving personalized ads

8     that relied on sWAA-off data?

9         A.   Correct.

10        Q.   Then why did you measure the value of        12:24:04

11    personalization for purposes of your unjust

12    enrichment opinion?

13        A.   I measured the -- to be -- to be clear, I

14    measured the value of -- I measured the relative

15    value of personalization.                              12:24:20

16             And the reason that I did that was

17    because when I calculated my Scenario 2 damages, I

18    needed to deduct nonpersonalized ads from two of my

19    revenue bases, revenue bases after considering

20    traffic acquisition costs and other -- and other      12:24:51

21    apportionments.  And the best data point available

22    is in this impact -- is in this ████████████

23    ██████

24             And so I was making a downward adjustment

25    in my model to ensure that I only deducted revenue     12:25:08
```

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ATTORNEYS EYES ONLY

| | | |
|---|---|---|
| 1 | they did not -- to Google.  The advertiser would | 02:10:16 |
| 2 | pay less to Google because Google did not -- would | |
| 3 | not serve an ad in those cases. | |
| 4 | Q.   But only to sWAA-off users.  It would | |
| 5 | still serve ads to sWAA-on users and signed-out | 02:10:27 |
| 6 | users, right? | |
| 7 | A.   That is -- whether -- whether or not it | |
| 8 | did or it did not doesn't concern me, because I'm | |
| 9 | only concerned with sWAA-off users.  So what it | |
| 10 | does outside of that -- | 02:10:40 |
| 11 | Q.   Right. | |
| 12 | A.    -- that's its business. | |
| 13 | Q.   So why would the advertiser pay Google | |
| 14 | less?  Why wouldn't it pay Google the same amount | |
| 15 | to place ads, and the ads would just be shown to a | 02:10:51 |
| 16 | different mix of people, namely, people who don't | |
| 17 | have sWAA turned off? | |
| 18 | MR. LEE:  Calls for speculation.  Lack of | |
| 19 | foundation. | |
| 20 | THE DEPONENT:  They would -- they would | 02:11:08 |
| 21 | pay them less because those ads that are currently | |
| 22 | being shown to sWAA-off users would not be shown to | |
| 23 | sWAA-off users.  They may go to a different | |
| 24 | advertising firm or a different -- different | |
| 25 | company that could serve those ads, but they | 02:11:25 |

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| | | |
|---|---|---|
| 1 | looking at the actual unjust enrichment in that -- | 02:33:32 |
| 2 | in that case. | |
| 3 |        I'm actually looking at what they | |
| 4 | actually earned, what was actually paid to them in | |
| 5 | that case. | 02:33:43 |
| 6 |     Q.  Right. | |
| 7 |     A.  And they -- in the but-for world, they | |
| 8 | would not have been able to serve those ads. | |
| 9 |        They did serve those ads, so that's what | |
| 10 | they actually earned.  That's my -- that's the | 02:33:56 |
| 11 | calculation that I'm making. | |
| 12 |     Q.  So, then, is it fair to say that you are | |
| 13 | not trying to hypothesize how consumer and | |
| 14 | advertiser and Google behavior would have changed | |
| 15 | in the but-for world?  Your task really was to | 02:34:13 |
| 16 | measure the exact amount of profits Google did make | |
| 17 | from sWAA-off advertising? | |
| 18 |     A.  Yes.  So in the but-for world, Google | |
| 19 | actually served those ads and actually profited | |
| 20 | from the information that it collected.  And | 02:34:35 |
| 21 | that's -- | |
| 22 |     Q.  In the real world? | |
| 23 |     A.  In the real world, they did. | |
| 24 |        In the but-for world, they should have | |
| 25 | not been able to. | 02:34:43 |

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ATTORNEYS EYES ONLY

```
 1    they've switched an ad blocker on.                02:42:37

 2            I've assumed -- I've assumed that their

 3    data is not available for Google to serve an ad in

 4    Scenario 2.

 5        Q.   So it's not an ad blocker; it's a Google  02:42:49

 6    ad blocker?

 7            MR. LEE:  Objection to form.

 8            THE DEPONENT:  My understanding is, based

 9    on input given to me, is that Google would not be

10    able to serve an ad in those situations.           02:43:06

11            Whether or not you want to call it an ad

12    blocker, I've never called it that, but Google

13    would not be able to serve an ad in those

14    situations.

15        Q.   (By Mr. Santacana)  Okay.                 02:43:19

16            Take a look at paragraph 87 of your

17    report.

18        A.   Okay.

19        Q.   And then 88, please.

20        A.   Okay.                                      02:45:17

21        Q.   In 87 and 88, you identify a figure,

22    82.2 percent, as equivalent to Google's

23    determination of the proportion of App Display

24    revenue from signed-in users as represented in the

25    ██████████████████████                             02:45:37
```

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# Appendix A-20

CONFIDENTIAL - ATTORNEYS' EYES ONLY

```
 1   ** C O N F I D E N T I A L **
 2   ** ATTORNEYS' EYES ONLY **
 3   UNITED STATES DISTRICT COURT
 4   NORTHERN DISTRICT OF CALIFORNIA
 5   SAN FRANCISCO DIVISION
 6   Case No. 3:20-CV-04688-RS
 7   -------------------------------x
     ANIBAL RODRIGUEZ, et al. individually
 8   and on behalf of all others similarly
     situated,
 9
             Plaintiff,
10
11
        - against -
12
13
     GOOGLE LLC,
14
             Defendant.
15   -------------------------------x
             June 26, 2023
16           10:05 a.m.
17
18       Videotaped Deposition of JONATHAN
19   HOCHMAN, taken by Defendant, pursuant to
20   Notice, held at the offices of Willkie Farr
21   & Gallagher LLP, 787 Seventh Avenue, New
22   York, New York, before Todd DeSimone, a
23   Registered Professional Reporter and Notary
24   Public of the State of New York.
25
```

Page 1

```
 1   look at the table of contents, because I
 2   don't know myself.  Okay, oops, this table
 3   of contents -- let me go into -- let me
 4   check in one other location here.
 5        Q.     I think you mean Appendix G,
 6   tab 4, but I could be wrong.
 7        A.     Yeah, let's take a look at
 8   that.
 9        Q.     It is pretty long, so maybe
10   I'll break down the question for a moment.
11        A.     Sure.
12        Q.     My first question is just did
13   you attempt in this case to join -- strike
14   that.  Let me try again.
15             Did you attempt in this case to
16   find evidence that Google had joined in the
17   same log device ID and GAIA ID?  Was that
18   one of the things you did?
19        A.     I think that had we noticed
20   that, had I noticed that, I would have
21   documented it.
22        Q.     Okay.
23        A.     So I --
24        Q.     I don't think you did.
25        A.     Yeah, I don't think I
```

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CONFIDENTIAL - ATTORNEYS' EYES ONLY

1  necessarily found an indication of joining.

2           So just to be clear, joining

3  and linking are two different things.

4  Joining means putting the two pieces

5  together in the same place.  Linking means

6  that there is just a logical connection

7  between the two pieces of data, okay?

8  There is a common identifier or there is a

9  common fingerprint, okay?  There might

10 be -- data might be stored in separate

11 places but there is a common -- there is a

12 link between them.

13      Q.     Got it.

14      A.     Okay?  So I'm using the

15 standard of linking, not of joining.

16      Q.     I understand.  So I hadn't

17 heard that distinction before, but join we

18 will use to mean actually joined together

19 in the same place, whereas linking is about

20 the availability of a mapping that may or

21 may not have been used to join.  Is that

22 fair to say?

23      A.     We don't know whether -- we

24 don't know whether someone has joined it or

25 not, we just know that it is linked, there

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```
 1        A.      Yes.
 2        Q.      And then in your definition of
 3   personalization, when you say "information
 4   associated with their user ID," there I
 5   think you are referring to, and I can pull
 6   up the document, but I think you are
 7   referring to information that is in what
 8   you called earlier a dossier about the
 9   user, right?
10        A.      Yes, and in this case it would
11   be the dossier of data collected in what
12   Google calls the user's account, in other
13   words, the area that's associated -- the
14   data structure that's associated with a
15   GAIA ID, or the data stored that is
16   associated with the GAIA ID.
17        Q.      Got it, okay.  So with that
18   clarification in mind, you're not -- you're
19   not disputing in this case that Google will
20   not personalize ads, as we have just
21   defined it in this back and forth, with
22   sWAA-off Google analytics for Firebase
23   data?
24        A.      That's correct.  I only said
25   that Google, just because they are not
```

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```
 1    into being contextual, but maybe there is
 2    something else that we haven't thought of.
 3         Q.    Okay.  But as far as you know,
 4    you're familiar that Google uses the term
 5    "contextual targeting" in their
 6    developer-facing pages?
 7         A.    Yeah, I'm aware of contextual
 8    targeting from the ad platform side and
 9    often that was referring to like based on
10    what words are in a content page on the
11    display network and what words the user --
12    the advertiser has specified in an ad
13    campaign, and they might say oh, okay, you
14    want to target people searching for white
15    sneakers and here is an article about white
16    sneakers, even though it is not a search,
17    it is just a context page, maybe we will
18    show your ad here because we think it is
19    especially relevant in this context.
20         Q.    Right.
21         A.    So that is kind of maybe a
22    little bit more specific than showing an ad
23    based on someone's language or their
24    general course location.
25         Q.    Right.  And from an internet
```

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```
 1    marketing standpoint, in order to

 2    effectuate contextual targeting in a

 3    responsible way, Google has to say

 4    something about its serving of ads, some

 5    type of information?

 6         A.      I would even go further than

 7    that.  I would say that in order to serve

 8    ads, Google needs to retain some data in

 9    order to comply with industry standards.  I

10    think Google is a member of the Media

11    Rating Council and they are certified for

12    generalized and valid traffic detection and

13    sophisticated and valid traffic detection,

14    and that's ad fraud detection.

15         Q.      Okay.

16         A.      So when you want to charge

17    someone for ads, you actually have to

18    retain some data in order to prove good

19    delivery of the ads.  You can't just say

20    hey, I have shown your ad a million times,

21    give me the money.  You actually have to

22    have some proof from a vendor who is MRC --

23    ideally MRC certified who can provide some

24    reliable statistics.

25                 This MRC was set up in the
```

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CONFIDENTIAL - ATTORNEYS' EYES ONLY

```
 1    1960s by the Congress because there at the
 2    time had been a lot of lying about
 3    advertising on like television, radio,
 4    newspapers, like lying about the reach of
 5    the advertising.  So Congress sort of
 6    decided to put an end to that and said
 7    let's certify the distribution of these
 8    ads.  So that has moved into the online
 9    era, and Google and Google Analytics are a
10    couple of the certified vendors.
11         Q.     Okay.
12         A.     That is more than what you
13    wanted to know about that, but it might be
14    helpful.
15         Q.     In the context of this case,
16    when we are talking about -- what's the
17    term you would use, bookkeeping,
18    recordkeeping, Ratings Council compliance?
19         A.     I would just say you want to
20    retain evidence of good delivery.  Because
21    one of the things as an advertiser that I
22    like Google for is that they try to
23    maintain a clean network.  They try to
24    protect me as an advertiser from ad fraud.
25    They tell us that they conduct proactive
```

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```
 1   investigations.  They have automatic

 2   systems that detect fraudulent activity and

 3   try to protect the advertiser from that.

 4        Q.      Isn't one of the ways they

 5   effectuate that by analyzing device ID and

 6   IP address?

 7        A.      Look, I can help you a little

 8   bit there.  I've done a bunch of ad fraud

 9   cases, and one of the things to do is to

10   look at the device ID and some of this

11   collected data.  So it is a known method

12   for detecting ad fraud.

13        Q.      Would Google have to drop that

14   detection method for sWAA-off users to

15   resolve the problems you've identified in

16   your report?

17        A.      I don't know.  Would there be

18   some way to work it out that these things

19   could coexist?  I'm not sure.  Again, I

20   would point back to my original

21   observation, which is Google has put itself

22   into a very difficult position by promising

23   the user, hey, we are going to be your

24   advocate for privacy and the vendors they

25   work with.  They've got some overlapping
```

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```
 1    and conflicting obligations, and that

 2    creates a problem for them and maybe they

 3    ought to focus on one business or the other

 4    in order to do the best possible job for

 5    each constituency.

 6         Q.     Okay.  Well, but for now let's

 7    assume that they are not going to drop

 8    users or drop advertisers in the immediate

 9    future.  The fraud detection mechanism that

10    you were just talking about it sounds like

11    relies on certain persistent or

12    non-temporary, non-transient identifiers,

13    right?

14         A.     This ends up being a deep

15    rabbit hole that we are going into here

16    about like how would Google do this.  I

17    mean, maybe there is some way that they can

18    work it out.  You know, maybe they can talk

19    to the advertisers and, you know, talk to

20    the industry standards and say hey, you

21    know, in order to respect privacy, we can't

22    collect this data for certain segment of

23    people who turn this off, but we know these

24    are real people because they've got Google

25    accounts.  You know, you have to have a
```

Page 208

```
 1    Google account in order to have a WAA and

 2    sWAA set.  So there is already some level

 3    of authentication there.

 4              Like if Google authenticates

 5    these people that these are real people who

 6    have real Google accounts, you know, maybe

 7    that is a substitute for the telemetry,

 8    perhaps, I don't know.  That's a really

 9    detailed thing that someone is going to

10    have to work out afterwards.

11       Q.    But if Google doesn't save

12    anything from the transaction, then that

13    would -- then it can't prove that it told

14    the truth that it was a Google account and

15    therefore a real person?

16       A.    Again, I don't know.  Like

17    could they work out some better

18    arrangement?  They might be able to work

19    out a better arrangement.  But looking back

20    retrospectively, you know, it was

21    essentially if you didn't collect this

22    data, you would have a lot of problems

23    charging for those ads.

24       Q.    And I think you say in your

25    report that if sWAA functioned the way that
```

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CONFIDENTIAL - ATTORNEYS' EYES ONLY

```
 1   is a little bit jargony.
 2        Q.      Well, and because you didn't
 3   use it in your report.
 4        A.      Well, but I talked about -- I
 5   talked about it.  I talked about the idea
 6   that the data that includes identifiers
 7   someone can extract an identifier from a
 8   phone and they can now match it to the
 9   data.  So joinability is like taking two
10   pieces of data and putting them together,
11   whereas reidentification is you have some
12   external source of knowledge and you
13   combine it with a piece of data and now you
14   have reidentified the data.
15        Q.      Got it.  Are you opining in the
16   case that Google has engaged in
17   reidentification of sWAA data?
18        A.      No, I'm not saying that Google
19   is doing this.  I'm assuming that Google
20   has the best intentions here, but that the
21   problem is from threat actors or external
22   pressure applied to Google.  Some foreign
23   government goes and puts pressure on Google
24   to release some data or something else
25   happens that causes that data to go out of
```

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```
 1    Google's control and somebody else is
 2    exploiting it, and of course, I mean, there
 3    is always insider risk, and maybe Google
 4    changed its policy, maybe Google is nice
 5    today but they become evil in the future.
 6         Q.     Okay.  So on that subject, you
 7    said something about Google having
 8    separated them, "them" being I guess GAIA
 9    logs and non-GAIA logs, they can put them
10    back together.  Do you recall that?
11         A.     Yes.
12         Q.     And I think you said, for
13    example, under some type of legal pressure.
14    Do you recall that?
15         A.     That's a possibility, sort of a
16    risk as a security technologist that one
17    would analyze and recognize.
18         Q.     Just to be clear, you do not in
19    this case render the opinion that Google
20    has for any particular member of the class
21    or named plaintiff put them back together
22    under legal pressure or for any other
23    reason?
24         A.     No, I haven't given that
25    opinion.
```

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# Appendix A-21

# UNITED STATES DISTRICT COURT
## NORTHERN DISTRICT OF CALIFORNIA

| | |
|---|---|
| ANIBAL RODRIGUEZ, SAL CATALDO, JULIAN SANTIAGO, and SUSAN LYNN HARVEY, individually and on behalf of all other similarly situated,<br><br>　　　Plaintiffs,<br><br>　　　v.<br><br>GOOGLE LLC,<br><br>　　　Defendant. | No. 3:20-cv-04688-RS |

## REBUTTAL EXPERT REPORT OF JOHN R. BLACK, PH.D.

### May 31, 2023

*Highly Confidential – Attorneys' Eyes Only*

evidence and Mr. Hochman's own report that AdView is terminology Google uses to name a log

that contains ad impression data.[107]

91.     An ad click is what it sounds like: a record that a user clicked (or tapped) on an ad

shown in a third party app or other advertising surface, such as a website. Here again, the ad

click entries in the record include information about the device displaying the ad, the app

displaying the ad, and the format of the ad.

92.     From my review of the adEvents log entries Google produced, I do not see any

information in the entries that could be considered "app activity" information, as none of it

relates to the activity the user engages in within the third party app serving the ad. The recording

of ad requests, impressions, and clicks alongside device information, timestamps, and other

similar record information is all directed at making a record that a user was shown or interacted

with an ad, so that the advertiser whose ad it is can know that. In this way, Google serves as a

bookkeeper for the advertiser. I am not aware of any use Google makes of sWAA-off adEvent

data other than to calculate conversions, as Mr. Hochman describes. And that calculation simply

connects the advertiser's interaction with the user at time 1 with another interaction with the

same advertiser at time 2.

93.     Next, Mr. Hochman opines that ad events data include identifiers. From my

review of the entries Google produced and the related evidence, I agree that ad events data can

include identifiers, and typically will include either a pseudonymous identifier such as ADID or

IDFA (when sWAA is off) or a GAIA (when sWAA is confirmed on). These identifiers can

---

[107] Hochman Report, ¶ 122 (Google Mobile Ads SDK sends data to "several types of ad events," including "ad views, in which the user views an ad displayed in the app[.]").

# Appendix A-22

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Attorneys for Defendant
GOOGLE LLC

**UNITED STATES DISTRICT COURT**

**NORTHERN DISTRICT OF CALIFORNIA**

**SAN FRANCISCO**

| | |
|---|---|
| ANIBAL RODRIGUEZ AND JULIE ANNA MUNIZ, individually and on behalf of all other similarly situated,<br><br>                                        Plaintiff,<br><br>        vs.<br><br>GOOGLE LLC, *et al*.,<br><br>                                        Defendant. | Case No.  3:20-CV-04688<br><br>**DEFENDANT GOOGLE LLC'S SECOND SUPPLEMENTAL OBJECTIONS AND RESPONSES TO PLAINTIFFS' INTERROGATORIES, SET SIX**<br><br>Judge:          Hon. Richard Seeborg<br>Courtroom:   3, 17th Floor<br>Action Filed:  July 14, 2020 |

PROPOUNDING PARTY:    PLAINTIFFS ANIBAL RODRIGUEZ AND JULIEANNA MUNIZ

RESPONDING PARTY:      DEFENDANT GOOGLE LLC

SET NO.:                          SIX (SECOND SUPPLEMENTAL RESPONSES)

**HIGHLY CONFIDENTIAL – ATTORNEYS' EYES ONLY**

1    Google further objects to this Interrogatory as overbroad, unduly burdensome, and

2    compound because it seeks an identification of every "data source (including logs)" without a

3    clear definition of what Plaintiffs consider to qualify as a "data source."

4    Google further objects to this Interrogatory as overbroad, unduly burdensome, and abusive

5    to the extent it seeks information regarding all uses of "WAA OFF DATA" without limitation to

6    data sent to Google by third-party app developers after collection, if any, through GA for

7    Firebase—i.e. concerning Plaintiff's theory of wrongdoing in the Third Amended Complaint.

8    Google further objects to this Interrogatory to the extent that it seeks information protected

9    by the attorney-client privilege and/or the attorney work product doctrine.

10    Subject to and without waiving the foregoing, Google responds as follows:

11    Google has provided exacting detail of its main logs associated with the transmission of

12    app-interaction / measurement data to Google via Google Analytics for Firebase when a user has

13    turned WAA to "off," *inter alia*, in response to Plaintiffs' Interrogatory No. 1. Google has also

14    provided samples of those primary logs that store the transmitted data, and is investigating further

15    potential data sources that may contain such data. Google states, however, that it is not practical or

16    relevant to account for every single potential data source (including logs) that may contain such

17    data because there are various downstream users of the pseudonymous data described in response

18    to Plaintiffs' Interrogatory No. 1. Nevertheless, the policies in place as described in response to

19    Interrogatory No. 1, including the policies that forbid the re-association of pseudonymous data

20    with personal identifiers, apply to all such downstream users of the data.

21    **INTERROGATORY NO. 15:**

22    Please DESCRIBE how GOOGLE currently uses and previously during the CLASS

23    PERIOD has used WAA OFF DATA, including by explaining the extent to which and how

24    GOOGLE currently uses and previously during the CLASS PERIOD used WAA OFF DATA to

25    track or measure conversions and personalize advertisements.

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GOOGLE LLC'S SECOND SUPPLEMENTAL OBJECTIONS AND RESPONSES
TO PLAINTIFFS' INTERROGATORIES, SET SIX
Case No.  3:20-CV-04688

**HIGHLY CONFIDENTIAL – ATTORNEYS' EYES ONLY**

1  **RESPONSE TO INTERROGATORY NO. 15:**

2      Google objects to this Interrogatory as vague and ambiguous with respect to the phrases

3  "track or measure conversions" and "personalize advertisements."  Google objects to this

4  Interrogatory as vague and ambiguous as to several undefined terms and phrases susceptible to

5  multiple meanings.  For purposes of this response, Google construes "Google" to mean Google

6  LLC and "WAA" to mean the account-level setting called Web & App Activity.

7      Google further objects to this Interrogatory as overbroad, unduly burdensome, and abusive

8  to the extent it seeks information regarding all uses of "WAA OFF DATA" without limitation to

9  data sent to Google by third-party app developers after collection, if any, through GA for

10  Firebase—i.e. concerning Plaintiff's theory of wrongdoing in the Third Amended Complaint.

11  Google further objects to this Interrogatory as duplicative, including because Google has already

12  responded to an interrogatory describing "what occurs when users . . .  turn off (or previously

13  paused) Web & App Activity."

14      Google further objects to this Interrogatory to the extent that it seeks information protected

15  by the attorney-client privilege and/or the attorney work product doctrine.

16      Subject to and without waiving the foregoing objections, Google responds as follows:

17  Google hereby incorporates its response and supplemental responses to Plaintiffs' Interrogatory

18  No. 1 as if set forth here, and objects to this Interrogatory to the extent it is duplicative of

19  Interrogatory No. 1. In addition to Google's responses to Interrogatory No. 1, Google responds

20  here that it uses data sent to it via Google Analytics for Firebase for each of the uses described in

21  its Privacy Policy and Google Analytics for Firebase Terms of Service, according to the settings

22  and consents provided by both end users and Firebase customers. This includes pseudonymous

23  conversion tracking and ad targeting for anonymized ad profiles.

24  **SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 15**

25      Subject to and without waiving the foregoing, Google responds further as follows:

26      DeviceID-keyed advertising interactions with an advertiser, such as views and clicks of

27  that advertiser's ads, are joined to conversions recorded in that advertiser's app using Firebase (or

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GOOGLE LLC'S SECOND SUPPLEMENTAL OBJECTIONS AND RESPONSES
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1   other third party conversion tracking products or services). In this way, Google serves as an

2   accountant, helping advertisers understand when the same device that interacted with their ad

3   subsequently converted (e.g., opened their app, or made an in-app purchase, depending on how the

4   advertiser has defined a conversion for the ad campaign).

5        When a user is signed in and has sWAA off, app activity data sent to Google via GA4F

6   while sWAA is off cannot be used for personalization. If a user is signed out on a device and also

7   happens to have one or more Google accounts that have sWAA turned off at the time of app

8   activity in a GA4F-enabled app on that device, that app activity data could become part of an

9   anonymized ad profile for ads personalization.

10  **INTERROGATORY NO. 16:**

11       Please DESCRIBE all facts that support or undermine a defense or affirmative defense that

12  YOU have asserted, intend to, will, or may assert in the present litigation.

13  **RESPONSE TO INTERROGATORY NO. 16:**

14       Google objects to this Interrogatory as compound and unduly burdensome.  Google objects

15  to this Interrogatory as vague and ambiguous with respect to the phrase "support or undermine a

16  defense or affirmative defense." Google further objects to this Interrogatory because it

17  prematurely seeks expert opinion. Google further objects to this Interrogatory to the extent that it

18  seeks information protected by the attorney-client privilege and/or the attorney work product

19  doctrine.

20       Subject to and without waiving the foregoing objections, Google responds that it is willing

21  to meet and confer with Plaintiffs over an appropriate response to this Interrogatory, including

22  with respect to how to address its compound nature.

23  **SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 16:**

24       Subject to and without waiving the foregoing, Google responds further as follows:

25       App developers who use the GA for Firebase SDK must agree to Google Analytics Terms

26  of Service, which requires that app developers disclose the use of Google Analytics and  how it

27  collects and processes data.  *See* https://firebase.google.com/terms/analytics;

28

**HIGHLY CONFIDENTIAL – ATTORNEYS' EYES ONLY**

1    https://marketingplatform.google.com/about/analytics/terms/us/.  App developers who use GA for

2    Firebase SDK have been expected to comply with the Google Analytics Terms of Service and/or

3    the GA for Firebase Terms of Service, including disclosing to end users that they use Google's

4    analytics services, and that certain data is being collected by the app developer and transmitted to

5    Google to store, process, and analyze.

6        Many app developers provide their end users with a way to opt out of analytics usage,

7    and/or to delete data the developer has collected from that user's device and sent to Google.  *See*

8    Ganem Rough Tr. at 139–41.  Upon receipt of such data, before logging any of it, as detailed in

9    response to Interrogatory No. 1, Google undertakes several consent checks if the developer has

10   enabled Google Signals or Enhanced Firebase Audiences.  Google uses a DSID token sent with

11   the app measurement data to query the EventFE server at Google.  If the user has a number of

12   privacy controls enabled, including sWAA, and the app developer has Google Signals enabled,

13   then the EventFE server will return a GAIA ID for that user, and GAIA-tied app measurement

14   data will be written to an app measurement-gaia log.  If EventFE does not return a GAIA ID, the

15   app measurement data is stripped of certain pieces of information that could be used to personally

16   identify the user who was using the device, and the app measurement data is logged only in

17   "pseudonymous space" to the app measurement log.  Google acts as a service provider to store,

18   process, and analyze  the app measurement data for the developer.

19       If the data was generated while WAA was off, the data is not written to ▮▮▮▮  and

20   therefore not used for personalized advertising purposes. Users also have the option to configure

21   their device and account settings to control whether ads are personalized.  *See, e.g.*,

22   https://support.google.com/accounts/answer/2662922#stop_goog_p13n.  If on a specific device,

23   the user has enabled the LAT control on iOS or clicked "Don't Allow" on the App Tracking

24   Transparency prompt on iOS (v.14.5 and up), the pseudonymous app measurement data will not

25   contain an IDFA.  If the user has enabled the OOOAP control on Android, when app developers

26   send app measurement data to Google through GA for Firebase, Google uses the OOOAP signal

27   to ensure that the data associated with the user's deviceID is not used for personalized advertising.

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GOOGLE LLC'S SECOND SUPPLEMENTAL OBJECTIONS AND RESPONSES
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# Appendix A-23

Firebase is back at Google I/O on May 14! Register now.
 (https://io.google/2024/?
utm_source=firebase&utm_medium=embedded_marketing&utm_campaign=&utm_content=)

# Log events

iOS+        ✓ Android        Web        Flutter

This guide shows you how to log events in your app.

Events (https://support.google.com/analytics/answer/9322688) provide insight on what is happening in your app, such as user actions, system events, or errors.

Analytics automatically logs some events (https://support.google.com/analytics/answer/9234069) for you; you don't need to add any code to receive them. If your app needs to collect additional data, you can log up to 500 different Analytics Event *types* in your app. There is no limit on the total volume of events your app logs. Note that event names are case-sensitive and that logging two events whose names differ only in case results in two distinct events.

## Before you begin

Make sure that you've set up your project and can access Analytics as described in Get Started with Analytics (/docs/analytics/get-started?platform=android).

## Log events

After you have created a `FirebaseAnalytics` instance, you can use it to log events with the `logEvent()`
 (/docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics#logEvent(java.lang.String,%20android.os.Bundle))
method.

To help you get started, the Analytics SDK defines a number of recommended events that are common among different types of apps, including retail and ecommerce, travel, and gaming apps.

To learn more about these events (https://support.google.com/analytics/answer/9322688) and when to use them, see Recommended events (https://support.google.com/analytics/answer/9267735).

**Note:** To get the maximum detail in reports, log the recommended events that make sense for your app and their prescribed parameters. This also ensures that you benefit from the latest Google Analytics features as they become available.

You can find implementation details for recommended event types in the following locations:

- Recommended events: see the `com.google.firebase.analytics.FirebaseAnalytics.Event` (/docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics.Event) class reference.

- Prescribed parameters: see the `com.google.firebase.analytics.FirebaseAnalytics.Param` (/docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics.Param) reference.

The following example demonstrates how to log a SELECT_CONTENT (/docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics.Event#SELECT_CONTENT) event:

Kotlin+KTX     Java
Android        Android

```
firebaseAnalytics.logEvent(FirebaseAnalytics.Event.SELECT_ITEM) {
    param(FirebaseAnalytics.Param.ITEM_ID, id)
    param(FirebaseAnalytics.Param.ITEM_NAME, name)
    param(FirebaseAnalytics.Param.CONTENT_TYPE, "image")
}
/analytics/app/src/main/java/com/google/firebase/example/analytics/kotlin/MainActivity.kt#L237-L241)
```

In addition to the prescribed parameters, you can add the following parameters to any event:

- Custom parameters: Custom parameters can be used as dimensions or metrics (https://support.google.com/analytics/answer/10075209) in Analytics reports (https://support.google.com/analytics/answer/9212670). You can use custom dimensions for non-numerical event parameter data and custom metrics for any parameter data better represented numerically. After you've logged a custom parameter using the SDK, register the dimension or metric to ensure those custom parameters appear in Analytics reports. Do this using *Analytics > Events > Manage Custom Definitions > Create Custom Dimensions*

  Custom parameters can be used in audience (https://support.google.com/firebase/answer/6317509) definitions that may be applied to every report. Custom parameters are also included in data

exported to BigQuery (https://support.google.com/firebase/answer/7030014) if your app is linked to a BigQuery project. Find sample queries and much more at Google Analytics 4 BigQuery Export (https://developers.google.com/analytics/bigquery).

- VALUE parameter: VALUE (/docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics.Param#VALUE) is a general purpose parameter that is useful for accumulating a key metric that pertains to an event. Examples include revenue, distance, time, and points.

If your application has specific needs not covered by a recommended event type, you can log your own custom events as shown in this example:

Kotlin+KTX    Java
Android       Android

```kotlin
firebaseAnalytics.logEvent("share_image") {
    param("image_name", name)
    param("full_text", text)
}
/analytics/app/src/main/java/com/google/firebase/example/analytics/kotlin/MainActivity.kt#L261-L264)
```

## Set default event parameters

You can log parameters across events using setDefaultEventParameters (/docs/reference/kotlin/com/google/firebase/analytics/FirebaseAnalytics#setDefaultEventParameters(android.os.Bundle))
. Default parameters are associated with all future events that are logged.

As with custom parameters, register the default event parameters to ensure they appear in Analytics reports.

Kotlin+KTX    Java
Android       Android

```kotlin
val parameters = Bundle().apply {
    this.putString("level_name", "Caverns01")
    this.putInt("level_difficulty", 4)
}

firebaseAnalytics.setDefaultEventParameters(parameters)
```

If a parameter is specified in the <u>logEvent()</u>
 (/docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics#logEvent(java.lang.String,%20androi
d.os.Bundle))
method, that value is used instead of the default.

To clear a default parameter, call the <u>setDefaultEventParameters</u>
 (/docs/reference/kotlin/com/google/firebase/analytics/FirebaseAnalytics#setDefaultEventParameters(android.o
s.Bundle))
method with the parameter set to `null`.

## View events in the Android Studio debug log

You can enable verbose logging to monitor logging of events by the SDK to help verify that events
are being logged properly. This includes both automatically and manually logged events.

You can enable verbose logging with a series of adb commands:

```
$ adb shell setprop log.tag.FA VERBOSE
```

```
$ adb shell setprop log.tag.FA-SVC VERBOSE
```

```
$ adb logcat -v time -s FA FA-SVC
```

This command displays your events in the Android Studio logcat, helping you immediately verify that
events are being sent.

## View events in the dashboard

You can view aggregated statistics about your events in the Firebase console dashboards. These
dashboards update periodically throughout the day. For immediate testing, use the logcat output as
described in the previous section.

You can access this data from the **Events** (https://console.firebase.google.com/project/_/analytics/events)
dashboard in the Firebase console. This dashboard shows the event reports that are automatically
created for each distinct type of event logged by your app.